

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Carol E. Ayers
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

January 2, 1987

RELEASE NO: 87-1

NOTE TO EDITORS/NEWS DIRECTORS

NASA FY-88 BUDGET PRESS BRIEFING SCHEDULED

The National Aeronautics and Space Administration will hold its fiscal year 1988 budget press briefing on Jan. 5, 1987, at 2:00 p.m. CST in the Headquarters Auditorium, 400 Maryland Avenue, S.W., Washington, D.C. NASA participants will include the Administrator Dr. James C. Fletcher, Deputy Administrator Dale D. Myers and Comptroller C. Thomas Newman.

The briefing will be carried live on NASA Select television with 2-way questions and answers including the NASA field centers. The briefing will be carried over NASA select at the Marshall Space Flight Center in the Communications Studio in building 4207 on Rideout Road.

For more information, news media representatives may contact the Marshall Center Media Services Branch at 205/544-0034.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

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For Release:
January 6, 1987

RELEASE NO: 87-2

NOTE TO EDITORS/NEWS DIRECTORS

STATE OF NASA AND MANAGEMENT STUDY RESULTS PRESS BRIEFING

NASA Administrator Dr. James C. Fletcher and Deputy Administrator Dale D. Myers will brief news media on the current state of NASA and results of the recently completed NASA management study.

The briefing will be held at noon CST, January 9, in the NASA Headquarters 6th floor auditorium, 400 Maryland Ave., S.W., in Washington, D.C.

The briefing will be carried live on NASA Select TV, with 2-way questions and answers, at the Marshall Space Flight Center in the Communications Studio in building 4207 on Rideout Road.

For more information, news media representatives may contact the Marshall Center Media Services Branch at 205/544-0034.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Jim Sahli
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January 14, 1987

RELEASE NO: 87-4

MSFC MAKES TECHNOLOGY AVAILABLE TO OTHERS

The Marshall Space Flight Center (MSFC) in Huntsville, Ala. is intensifying its efforts to make aerospace-related technology available to potential users in the private sector as well as other federal, state and local governments, and universities.

During the past three months, six officials from the Tennessee Valley Authority in Knoxville visited the Center for a review of available technologies and to study the method Marshall uses to make these developments known to potential users.

Earlier, Dean Matthews, executive director of the Top of Alabama Regional Council of Governments (TARCOG), visited the NASA facility for a briefing on technologies that may be used to stimulate jobs or productivity in TARCOG's five-county area.

"We provided him with access to NASA Tech Briefs and computer software programs, and listened to his proposal to create a five-

-more-

person TARCOG technology committee. We are here to assist local industry. We are currently working to have several industries out to Marshall for a visit and orientation," said Ismail Akbay, director of Marshall's Technology Utilization Office.

Also, the University of Alabama in Huntsville recently was briefed on advanced technologies developed in connection with the space program.

These visits follow in the wake of the Stevenson-Wydler Technology Innovation Act, and subsequently the Federal Technology Transfer Act. This 1986 legislation directs federal government laboratories to establish closer links with private industry and other government agencies.

"The intent of the legislation is to facilitate the flow of taxpayer-funded high technology developments into other applications often far removed from the original aerospace program. Many of these technologies have found their way into the biomedical engineering, industrial production and public safety fields, to name a few," said Akbay.

Federal laboratories across the United States are setting up technology transfer offices to comply with the new legislation. NASA set up these technology transfer offices shortly after the Space Act of 1958 was implemented. The Space Act stated that mankind should benefit from the research and development efforts of the space program.

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The legislation also allows authorized federal laboratories such as NASA to enter into cooperative research and development contracts with other federal agencies, state and local governments, industrial organizations including universities, or other persons including licensees of inventions owned by the federal agency.

Efforts also are being made to increase the potential use of new technologies generated by aerospace contractors and government employees. The Center received 260 new technology reports in 1986.

Akbay said the Center not only provides published reports on new technologies available to secondary users, but also assists by making information available on computer software programs that may be used in the private sector.

"We also circulate problem statements from various sources related to improvements needed in the medical field, industrial production, public safety and energy. These requirements go to our laboratory engineers for evaluation and a possible match-up of technology," said Akbay.

"During the past six years, we have published 901 technology reports involving 474 government employees and 1,036 contractor personnel. If the reports are selected for publication in NASA Tech Briefs, which is circulated to over 100,000 potential users, the civil service or contractor innovator receives a \$150 cash award.

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"We have an active information dissemination effort to try to enlighten others about space-related technology. During the past six years, the Center has sent out over 328,000 technical information packets in response to inquiries from the public and industry," said Akbay.

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National Aeronautics and
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George C. Marshall Space Flight Center
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January 15, 1987

RELEASE NO: 87-5

NOTE TO EDITORS/NEWS DIRECTORS

A media briefing on Space Shuttle Program Recovery Progress will be held at noon CST, Tuesday, January 20. Participants will include NASA Associate Administrator for Space Flight RADM Richard Truly, National Space Transportation System Director Arnold Aldrich, Marshall Space Flight Center Director J.R. Thompson, and others.

The briefing will originate from NASA Headquarters in Washington, D.C., and will be carried live on NASA Select TV with two-way question and answer capability available at the Marshall Center Communications Building, 4207.

-30-

NASA News

National Aeronautics and
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For Release:
January 27, 1987

RELEASE NO: 87-7

NASA'S SOLID ROCKET MOTOR DESIGN MANAGER WORKING NEXT SEVERAL WEEKS IN UTAH

John W. Thomas, manager of NASA's Solid Rocket Motor Design Team at the Marshall Space Flight Center, will be onsite at Morton Thiokol's Wasatch Division in Utah for the next several weeks. Morton Thiokol is NASA's prime contractor for the solid rocket motor.

Thomas leaves for Utah later this week where he will be concentrating on preparations for the static firing of Development Motor 8, the first full scale test of the new designed motor. That test is planned for sometime in July.

"The majority of my time and attention will be on seeing that all activities and hardware are focused toward achieving this critical test milestone in a timely manner," he said. "To do this, I feel that it is necessary to join Royce Mitchell's onsite team at Morton Thiokol and concentrate on those things specifically related to DM-8."

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Mitchell is the Marshall Center's manager of the Solid Rocket Motor Office. He has been working onsite at Thiokol since October.

According to Thomas, the operation of the Design Team will remain unchanged during his absence from the Marshall Center. Jim Blair, deputy Design Team manager, will be responsible for routine day-to-day operations.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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For Release:

February 4, 1987

Mark Hess
Headquarters, Washington, D.C.
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RELEASE: 87-8

PROPOSALS SOUGHT FOR SPACE STATION PROGRAM SUPPORT

NASA yesterday issued a "request for proposal" (RFP) to U.S. industry for a program support contractor to assist the NASA Space Station Program Office in Washington, D.C., with systems engineering, analysis and integration activities and also to support field offices to be established at five NASA centers. Program support contractor proposals are due April 3.

"The establishment of Space Station field offices and the use of a program support contractor will integrate field expertise with the required program control and accountability," said Luther Powell, manager of the Space Station Projects Office

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at the Marshall Space Flight Center. "This approach will give NASA access to the best minds in the country, in both government and private sector, to support the Space Station program."

The Space Station is a major new NASA endeavor planned for operation in the mid 1990's. The Space Station will be a permanently manned facility in low-Earth orbit that will support science, technology and commercial research in space.

The program support contractor will assist the Space Station program office in assuring that top-level system design considerations are preserved, that the program goals of productivity and versatility to achieve user needs are achieved and that NASA's goals of flight safety and cost effective performance are met.

The program office is responsible for overall development of the Space Station, including engineering analysis, program planning and control, resources, configuration management and integration of all elements into an operating system.

A major portion of the systems integration will be performed at NASA centers through Space Station field offices to be established at Goddard Space Flight Center, Greenbelt, Md.; Johnson Space Center, Houston; Kennedy Space Center, Fla.; Lewis Research Center, Cleveland; and Marshall Space Flight Center, Huntsville, Ala.

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The program support contractor is the third major RFP to be issued in support of future Space Station development activities. The technical and management information system and software support environment RFPs currently are under evaluation. Contracts are expected to be awarded in April and May, respectively. The program support contract is expected to be awarded in July.

NASA also is expected to issue, in the near future, RFPs for the detailed design and development of Space Station hardware and systems.

NASA News

National Aeronautics and
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For Release:

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March 9, 1987

RELEASE NO. 87-13

NASA MANAGERS RECEIVE PRESIDENTIAL AWARDS

Two managers at NASA's Langley Research Center have received Presidential Rank of Meritorious Executive Service Awards.

Robert L. Swain, Director for Systems Engineering and Operations, and Dr. James D. Lawrence Jr., Chief, Atmospheric Sciences Division, were presented the Senior Executive Service awards for "sustained superior accomplishment in management of programs of the United States Government and for noteworthy achievement of quality and efficiency in the public service."

Employed at Langley since May 1955, Swain manages the organizations responsible for the services required to support the center's research programs and institutional plant, including the construction of facilities program, mechanical and electrical systems, complex research facilities, equipment and test apparatus; complex aerospace systems and research test articles; comprehensive safety, quality and reliability; and institutional buildings, structures and ground maintenance.

He and his wife, Sandra, live in Newport News. They have two children.

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February 10, 1987

RELEASE NO: 87-31

NOTE TO EDITORS/NEWS DIRECTORS

NEXT SHUTTLE CREW WILL VISIT MARSHALL CENTER FRIDAY

The recently selected crew for the next Space Shuttle mission will visit the Marshall Center Friday. As part of the visit, the crew will be available to meet with the news media from 1:30 to 2 p.m. in the Marshall Communications Center in building 4207.

Other possible photo opportunities of the crew include their 8:30 a.m. arrival at the Redstone Arsenal Airstrip; a 10 to 10:30 a.m. welcome and introduction of the astronauts to Marshall employees gathered in the Morris Auditorium of the Center's Headquarters building, 4200; and a 10:30 to 11 a.m. informal employee reception with the crew in the lobby of building 4200.

The crew is visiting the Marshall Center to meet with a broad cross-section of the Center's people and to get a first-hand sense of the dedication and commitment of the total Marshall workforce in returning the Shuttle to safe flight.

Crew members are: Commander Frederick H. Hauck, Pilot Richard O. Covey, and Mission Specialists George D. Nelson, David C. Hilmers and John M. Lounge. They will be accompanied by Astronaut Robert L. Gibson.

-30-

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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For Release:

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Feb. 25, 1987

Also released in
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RELEASE NO: 87-34

NASA AND MORTON THIOKOL REACH PRELIMINARY UNDERSTANDING

NASA and Morton Thiokol, Inc. have reached a preliminary understanding on resolution of contractual issues resulting from the Challenger accident and on restructuring of the Space Shuttle solid rocket motor contract.

It is expected that a contract modification reflecting this understanding will be signed by October, following submission and negotiation of Morton Thiokol's detailed proposal.

Both NASA and Morton Thiokol believed it was in the best interest of all concerned to resolve the matters without resorting to lengthy and expensive litigation, that also could have diverted attention from the critical national priority of safely returning the Shuttle to flight.

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Officials of Morton Thiokol's Aerospace Group, prime contractor for the solid rocket motors, and NASA's George C. Marshall Space Flight Center, which manages the motor program for NASA, have been negotiating since last summer. Topics discussed included a \$10 million fee penalty provision of the contract, work necessary to fix the design defects in the motor joints, new work required due to NASA-directed safety and reliability enhancements in the motor, and restructuring the remainder of the contract.

As the result of negotiations, the following is the framework for a contract modification:

Morton Thiokol has voluntarily accepted a \$10 million reduction in the profit it earns under the contract. As a result of this reduction, it is unnecessary for NASA to further consider a levy of the fee penalty.

Further, Morton Thiokol will perform at no profit approximately \$409 million worth of work required to fix the faulty joints, rework existing hardware to include the design fix, and replace the reusable motor hardware lost in the Challenger accident.

The contract work remaining at the time of the accident, plus additional work ordered by NASA for safety and reliability enhancements on motor parts not connected with the accident, will

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be performed by Morton Thiokol under the restructured contract. This portion of the work effort will cost approximately \$487 million. Morton Thiokol's profits for this work will be based on its performance in areas such as quality, technical performance, schedule, business management and cost control.

This work will bring the total contract cost to approximately \$1.3 billion. Morton Thiokol already had completed about \$418 million worth of work under its contract at the time of the Challenger accident. The maximum potential profit Morton Thiokol can earn for the total effort will be \$86 million. To date, about \$41 million in profit payments have been made.

NASA News

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February 26, 1987

RELEASE NO: 87-36

MARSHALL FACILITY TESTS EFFECTS OF SPACE DEBRIS ON SPACECRAFTS

Scientists and engineers at the Marshall Space Flight Center (MSFC) in Huntsville, Ala., are using a "light gas gun" to study the effects space debris might have on long duration orbital spacecraft such as NASA's Space Station.

The "gun" is part of Marshall's Micrometeoroid/Space Debris Impact Facility and is located in the Materials and Processes Laboratory. The 60-foot long apparatus is being used to test the effects of projectiles striking sheets of metal. This testing simulates damage space vehicles like the Space Station might suffer if struck by space debris.

"This facility is being used to test developmental structural configurations and candidate materials for long duration orbital spacecraft," said Roy Taylor, chief of the Laboratory Support Branch in the Materials and Processes Laboratory at Marshall.

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"Hydrogen gas is compressed through a piston and the compressed gas accelerates a projectile at speeds up to 26,000 feet per second or 17,712 miles per hour. (This is 87 times the landing speed of the shuttle.) The piston is accelerated by a 300-gram powder charge. The powder in turn is ignited with an electric squib," he said.

Taylor said that projectiles ranging from 2.5 to 12.7mm diameter are fired at sheets of metal. The sheets of metal are then analyzed to determine how future spacecraft might be effected by space debris.

"We are working with Boeing to do the test samples, so that they can analyze and fulfill their test requirement for a damage control and penetration study contract they have with MSFC," Taylor said.

The "gun" was originally purchased in 1965 to fill a need for meteoroid simulation to study the effects of micrometeoroid impacts on materials and various spacecraft structural designs. Several approaches had been taken to the problem of accelerating projectiles to hypervelocities. But, the light gas gun is the only system capable of routinely launching projectiles of variable dimensions, mass and velocity.

"The gun was used in the late sixties for micro meteoroid testing for Skylab. It was inactivated in 1971. Then, in July 1984 due to the increased interest in the possibility of collision with meteoroids and orbital debris, the facility was reactivated. We began our first testing for space station

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applications in August 1985. Thus far, we have performed over 480 tests for space station work," he said.

Skylab was America's and the world's first space station. It was launched May 14, 1973. Three different crews flew their Apollo spacecraft to Skylab. The final mission lasted 84 days. The MSFC-developed space station reentered Earth's atmosphere on July 11, 1979.

Another type of testing will be starting soon using another portion of the space debris impact facility.

"At the other end of our 'light gas gun,' we are configuring a large test tank. We will launch a projectile of sufficient mass and velocity to cause a penetration and assess the internal effects," Taylor said.

"It will be used in the evaluation of penetrations into an equipment module for the space station. We want to find out what the effects of penetration into a module actually are. If we have penetration, what kind of pressures are there? What kind of flashes are there? What is the noise level inside a module? That big tank will simulate a piece of space debris impacting a spacecraft," Taylor said.

The Marshall Space Flight Center has a leading role in the space program. Currently, the Marshall Center is responsible for a wide variety of NASA projects ranging from development of the Edwin P. Hubble Space Telescope and production of the propulsion elements of the Space Shuttle to management of Spacelab Earth-orbital missions and other payloads for the Space Shuttle.

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Also, the Marshall Center has been given a substantial role in the development of Space Station, a permanent manned facility proposed by President Reagan to be in orbit by 1994. The station will offer the capabilities of scientific research and technology development by both government and industry; the commercial use of space in such areas as the manufacture of critical materials and pharmaceuticals not available on Earth; the assembly, servicing and repair of satellites and other large structures in space; and research focused on extending a human being's staying time in space as a first step toward more ambitious manned space programs.

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For Release:
March 9, 1987

RELEASE NO: 87-39

MARSHALL EMPLOYEES SELECTED NASA INVENTORS OF THE YEAR

Ernest O. Bayless and Samuel D. Clark, employees at the Marshall Space Flight Center in Huntsville, Ala., and W. Robert Dempsey, a local contractor, have been selected as the 1986 NASA Inventors of the Year for their invention of an arc welding torch, according to NASA General Counsel John E. O'Brien.

According to Leon D. Wofford, Marshall's chief patent counsel, this is the third straight year a Marshall employee has been selected as a NASA Inventor of the Year. Last year, George L. von Pragenau of Marshall was selected.

"Fantastic! That's how I felt when we were notified that we were being put in for Inventor of the Year Award. That in itself was a great accomplishment as far as I'm concerned because of all the good work that goes on at Marshall," said Clark, a six-year NASA employee in the Metals Processes Branch of the Materials and Processes Laboratory.

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"I am tickled with the award. I had no idea we would be selected from all the NASA centers. It's a great honor and I'm really proud of it," said Bayless, who is chief of the Metals Branch. Six NASA field centers submitted inventions for this year's award.

The inventors' arc welding torch was developed more than three years ago and is in use at MSFC and the Michoud Assembly Facility in New Orleans, according to Bayless.

"We have six units here and we use them for development work here. The torch is used at Michoud to build the Space Shuttle external tank," Bayless said.

In nominating Bayless and Clark, Center Director J.R. Thompson wrote that the invention "provides a complete new design for a plasma arc welding torch. The torch has been particularly effective in variable polarity plasma arc welding. The torch has overcome the deficiencies of previous arc welding torches which were prone to have water and gas leaks and which often complicated work assembly requirements because of the difficulty in electrode centering. The torch is very compact and provides access to wide variety of weld joints and hardware configurations."

"Once again Marshall employees have risen to the top. It is great that our people have been recognized NASA-wide for their efforts. These two people represent all the innovative, talented and hard working people we have at Marshall," Thompson said.

Bayless defines variable polarity plasma arc welding as the

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latest development in sophisticated welding technologies. The process combines the action of a high velocity jet of hot plasma, which penetrates completely through the workpiece to flush any contaminants from the weld joint, with the cathodic cleaning of the surface by a scheduled reversing of the polarity. The result is an ultraclean weld, free of internal defects.

W. Robert Dempsey, co-inventor of the arc welding torch, is a businessman from Brownsboro, Ala.

"Dempsey won the development contract for the torch. We solicited his ideas on numerous occasions on how to build the torch and how to better assemble it. His ideas are very prominent in the torch," Bayless said.

O'Brien also announced the NASA nominee for the National Inventor of the Year Award. The agency selected Henry G. Kosmahl of Lewis Research Center for his work entitled "Linearized Traveling Wave Amplifier with Hard Limiter Characteristics."

NASA will formally recognize its Inventors of the Year and its nominee for the national award March 26 at the monthly Inventions and Contributions Board meeting in Washington, D.C.

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March 9, 1987

RELEASE NO: 87P-39

MARSHALL EMPLOYEES SELECTED NASA INVENTOR OF THE YEAR

Ernest O. Bayless (left) and Samuel D. Clark, employees at the Marshall Space Flight Center, inspect an arc welding torch. The torch, which was invented by Bayless and Clark, won the duo NASA Inventors of the Year honors for 1986. The torch is used in development work at Marshall and in building the Space Shuttle external tank at the NASA's Michoud Assembly Facility in New Orleans. This is the third straight year that Marshall employees have won the NASA award. The two inventors will be formally recognized by NASA March 26 in Washington, D.C. (NASA photo by Dennis Keim)

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NASA News

National Aeronautics and
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For Release:
March 13, 1987

RELEASE NO: 87-42

ENGINEERING TEST MOTOR TO BE MODIFIED

NASA and Morton Thiokol, Inc. have determined that rework of the solid rocket Engineering Test Motor (ETM) will be required before it is fired. The test was scheduled for late March but is now expected to take place in early to mid May. It is not anticipated that this situation will cause a schedule delay in other test motor firings or the February 1988 target Space Shuttle launch date.

The recent firing on February 23 of the versatile and successful solid rocket motor Joint Environment Simulator provided data which indicated potential insulation bonding deficiencies in the "U" seal of the case joints of the ETM.

The ETM will still preserve the bulk of its test objectives. The ETM firing will allow evaluation of an improved and highly-instrumented exhaust nozzle and testing of strong, case-girdling bands which limit case joint rotation. It will

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also be the first test of an External Tank structural attachment ring on a full-duration ground test motor. It allows continued refinement of measurements of solid rocket motor pressurization at ignition and the resulting possible structural effects on the rest of the Shuttle vehicle and its payloads.

The rework of the ETM will delay evaluation of the sealed joint insulation until the test firing of the fully redesigned Development Motor #8 in late July. The "U" seals in the ETM will be replaced with 51-L type seals so that the ETM test may proceed.

NASA News

National Aeronautics and
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For Release:
March 17, 1987

RELEASE NO: 87-44

MARSHALL EXHIBITS TO BE DISPLAYED IN JAPAN

March 21 will be a special day for the City of Okazaki, Japan, and the Marshall Space Flight Center in Huntsville, Ala., will be part of it. That's when Okazaki begins celebrating its 70th birthday and the NASA facility will provide exhibits for a large international exposition.

Expo Okazaki '87 will continue through May 17 and is expected to draw more than one million visitors to the city of 290,000, which is approximately 150 miles south of Tokyo.

Numerous exhibits and models provided by the Marshall Center will be part of the exposition which organizers say will be "a forerunner of the future and a symbol of renewed cultural exchange between Japanese and other peoples of the world."

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According to Tim Tyson of the Marshall Public Affairs Office, NASA's invitation to participate in the exposition originated last summer after visitors from Okazaki saw a NASA exhibition at the Vancouver World's Fair.

"After that, the visitors decided to inquire about the possibility of NASA participating in Expo '87 in Okazaki. We were very pleased when NASA Headquarters asked the Marshall Center to represent the space agency in this endeavor in Japan," said Tyson, who will travel to Japan this week to coordinate NASA's participation.

"This is a first for the Marshall Center. In the past, Marshall has joined other NASA centers in providing exhibits to international expositions. This is the first time the Center has been the lead center for such an event," Tyson added.

The exhibits highlight Marshall and Japanese cooperation in the Spacelab J Mission, scheduled as a payload for the Space Shuttle, and Japanese participation in the Space Station.

The displays include a new three-panel Spacelab J exhibit, a 1:15 scale Spacelab J model designed to fit into the cargo bay of a 1:15 scale Shuttle orbiter. Also on display will be a 1:200 scale Space Station model and an Apollo space suit that the Japanese plan to outfit as part of the exhibit.

The NASA exhibit will be adjacent to an exhibit provided by National Space Development Agency of Japan (NASDA). "This will be the first time that NASA and NASDA have exhibited together in Japan," Tyson said.

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He said that among other items, NASDA's exhibit will feature a scale model of their proposed Space Station module and a 1:20 scale model of the H-1 rocket, considered the workhorse of the Japanese space program.

Tyson said the exposition will include exhibits from both the United States and Europe as well as Japan.

The Marshall Space Flight Center has a leading role in the space program. Currently, the Marshall Center is responsible for a wide variety of NASA projects ranging from development of the Edwin P. Hubble Space Telescope and production of the propulsion elements of the Space Shuttle to management of Spacelab Earth-orbital missions and other payloads for the Space Shuttle. Also, the Marshall Center has been given a substantial role in the development of Space Station, a permanent manned facility proposed by President Reagan to be in orbit by 1994. The station would offer the capabilities of scientific research and technology development by both government and industry; the commercial use of space in such areas as the manufacture of critical materials and pharmaceuticals not available on Earth; the assembly, servicing and repair of satellites and other large structures in space; and research focused on extending a human being's staying time in space as a first step toward more ambitious manned space programs.

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For Release:

April 1, 1987

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RELEASE NO: 87-55

NASA TO SEEK ADVANCED SOLID ROCKET MOTOR

NASA Administrator Dr. James C. Fletcher today announced that NASA plans to initiate definition of an Advanced Solid Rocket Motor (ASRM) for the Space Shuttle. The ASRM program will begin with a "Phase B" engineering definition effort and other supporting studies in fiscal years 1987 and 1988. A decision to pursue a "Phase C/D" effort (design, development, test and production) could be made, based on the results of the Phase B activity, by proposing a "new start" in the fiscal year 1989 budget process.

In reaching the decision to initiate Phase B studies for the ASRM, NASA considered three alternate courses of action: (1) initiate a competition for a second source for the redesigned configuration of the current SRM that will be flown on the first

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post-ST5 51-L Shuttle flight: (2) continue procuring SRMs from the present supplier (Morton Thiokol, Inc. (MTI), Brigham City, Utah); and (3) initiate an ASRM effort that could be followed by a competitive procurement for development and production of the ASRM. All of these approaches would have involved additional procurements from MTI.

NASA has concluded that the approach of pursuing the development of an ASRM offers two advantages not provided by other alternatives: (1) an opportunity for improved quality and safety through automation and advanced manufacturing methods and (2) potential improvements in performance to ensure that the Shuttle system will meet all its national lift requirements.

This decision reflects the completion of a "Phase A" activity in which five aerospace firms performed conceptual studies of alternative SRM designs. This Phase A effort was initiated in September 1986 and managed by NASA's Marshall Space Flight Center (MSFC), Huntsville, Ala.

NASA will initiate an open competition for a Phase B effort for ASRM definition, which also will be managed by MSFC. Proposals for this effort will be invited from all qualified sources including those participating in previous Phase A efforts: Aerojet Strategic Propulsion Co., Sacramento, Calif.; Altantic Research Corp., Alexandria, Va.; Hercules Aerospace Company's Aerospace Div., Salt Lake City, Utah; Morton Thiokol Inc.; and United Technologies, Chemical Systems Divi., San Jose, Calif.

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If a decision is made to proceed with a Phase C/D effort, it is anticipated that the ASRM could be available in fiscal year 1993.

Concurrently NASA will undertake "Phase A" conceptual studies of alternative liquid boost technology. The liquid boost studies will provide data on which to base long-term decisions concerning appropriate future Shuttle propulsion systems. This effort also will be managed by MSFC.

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For Release:
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RELEASE NO: 87-56

MARSHALL NAMES TANDBERG-HANSSSEN
SPACE SCIENCE LABORATORY DIRECTOR

Marshall Space Flight Center officials in Huntsville, Ala., announced Tuesday that Dr. Einar A. Tandberg-Hanssen has been named Director of the Space Science Laboratory, Science and Engineering Directorate. He has served as deputy director of the Space Science Laboratory since December 1983.

Tandberg-Hanssen joined the Marshall team in 1974 as a senior research scientist in the Space Science Laboratory and initially served as the principal investigator (scientist) for the Skylab/Apollo Telescope Mount X-Ray Telescope Experiment. Since 1974, he has served as the principal investigator on the Ultraviolet Spectrometer and Polarimeter experiment which is aboard the Solar Maximum Mission satellite launched in February 1980. The equipment has produced discoveries of solar phenomena never before witnessed.

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Tandberg-Hanssen was born at Bergen, Norway, in 1921. He received his bachelor of science degree in general studies in 1946 and a master of science degree in physics, both from the University of Oslo in 1950. Tandberg-Hanssen received a Ph.D. in astronomy in 1960, also from the University of Oslo.

Prior to coming to Marshall, Tandberg-Hanssen served on the senior staff of the High Altitude Observatory at Boulder, Colo., and as lecturer in the Department of Physics and Astrophysics, at the University of Colorado. His previous experience includes extended stops at the Institut d'Astrophysique, Paris, France, the California Institute of Technology, Pasadena, Calif., and Cavendish Laboratory, Cambridge, England.

In addition to authoring several books, Tandberg-Hanssen has written numerous scientific and technical publications concerning solar physics, solar activity, and radio astronomy. He currently serves on the editorial board of Solar Physics journal. He served as vice president of the International Astronomical Union's Commission 10 on Solar Activity from 1979 to 1982 and as its president from 1982 to 1985. Currently, he is the vice president of the Federation for Astronomical and Geophysical Services and is serving as adjunct professor of physics at the University of Alabama in Huntsville.

Tandberg-Hanssen and his wife, Erna, live in Huntsville. They have two daughters.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Jim Sahli
Marshall Space Flight Center
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For Release:
April 2, 1987

RELEASE NO: 87-57

MARSHALL SCIENTISTS TO STUDY SUPERNOVA DOWN UNDER

Scientists and engineers from the Marshall Space Flight Center in Huntsville, Ala., will travel to Australia in May to launch a high-altitude balloon experiment to learn more about possible gamma ray emissions from Supernova 1987a, the nearest such star explosion to the Earth since 1604.

Dr. Gerald J. Fishman of Marshall's Space Science Laboratory will lead the scientific team which will launch the balloon from Alice Springs, Australia, to study the star explosion which was first detected by astronomers on Feb. 24.

"The discovery of the supernova represents a major scientific opportunity and scientists from around the world are anxious to study it," Fishman said, adding that the Marshall Center proposal to study the supernova was one of three selected last week by NASA out of a dozen proposals submitted.

The balloon flight is expected to last just one day. The balloon should drift east 400-500 miles toward a downrange tracking station, Fishman said. Scientists expect to lose the

-more-

balloon, but the detector will transmit its data and then be parachuted back to earth.

The group will leave the first week of May and will spend nearly three weeks setting up and launching the experiment.

The experiment is a collaboration with Lockheed's Palo Alto Laboratory, which will provide the sensitive gamma-ray detector. Marshall Center will supply the balloon equipment.

The other two proposals for balloon experiments came from the California Institute of Technology and a team consisting of Bell Laboratories and Sandia National Laboratory, said Richard Bradford of NASA's Wallops Flight Facility. Bradford said that all three balloon experiments will occur at about the same time.

Bradford added that the University of Melbourne, Australia, in conjunction with Case Western Reserve University, is financing its own balloon flight.

The supernova, located about 155,000 light years away, is at a declination of 69 degrees south and can only be observed in the southern hemisphere. A single light year, the distance light travels in a year, equals 6.6 trillion miles.

NASA's Deep Space Network station near Canberra, Australia, configured with Australia's Parkes Radio Observatory has been observing the radio wave emission from the supernova.

The 20-story-tall, gas filled balloon carrying the experiment package will rise above most of the Earth's atmosphere and then point its instruments at the supernova to detect any possible gamma ray emissions.

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"Gamma rays can't penetrate the Earth's atmosphere; that's why we have to use high-altitude balloons to study them," Fishman said.

Other members of the Australian expedition include: Dr. Robert B. Wilson, Dr. Charles A. Meegan, W. Thomas Sutherland, Robert W. Austin, Mike King, Max Love Jr, William E. Hammon, Stanley Dothard, William M. Bond and Fred A. Berry Jr, all from Marshall's Space Science Laboratory. Other team members from the University of Alabama in Huntsville are Dr. William Paciesas and Martin Brock.

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National Aeronautics and
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For Release:
April 2, 1987

Charles Redmond
NASA Headquarters, Washington, D.C.
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RELEASE NO: 87-58

MARSHALL SCIENTIST SELECTED TO BE A PRINCIPAL INVESTIGATOR FOR TETHERED SATELLITE SYSTEM

Dr. Noble H. Stone of Marshall Space Flight Center in Huntsville, Ala., has been selected as a principal investigator for the Tethered Satellite System (TSS-1), a deployable subsatellite to be "tethered" to the Space Shuttle via a retractable cable. Assuming resumption of Shuttle flights as currently scheduled, TSS-1 would fly aboard Columbia in the fall of 1990.

Stone's experiment, "Research on Orbital Plasma-Electrodynamics Using Satellite-Mounted Sensors", and the experiments of four other American principal investigators will make use of the TSS-1.

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The Marshall Space Flight Center has been assigned project management with John Price, the TSS project manager, and Bill Duncan, the TSS instrument manager.

The Tethered Satellite System is a joint U.S.-Italian project with NASA as the U.S. partner and the Piano Spaziale Nazionale (PSN) as the Italian partner. The United States and Italy will each provide investigators and experiments. Italy will build the satellite while the United States will build the deployment mechanism and fly the complete payload aboard the Shuttle.

Several of the investigators will conduct investigations into the dynamics of the tether as it is deployed from the Shuttle to a length of 12.5 miles. This information is essential to understanding future applications of tethers for towing microgravity laboratories from the Space Station.

Most of the selected investigators will concentrate on measuring and understanding the electrical interaction between the satellite with the electrically-conducting tether and the natural space plasma environment. This environment is caused by solar ionization of the Earth's upper atmosphere through which the Shuttle flies in its operational altitude range of 120 to 350 miles.

The satellite, tether and Shuttle, moving through this ionized environment and the Earth's magnetic field, act like an electrical generator. This system can generate a 5000-volt potential at several amps of current yielding 10 kilowatts of

-more-

electrical power. This current flows in the conducting tether and through the ionized environment, creating low frequency hydromagnetic, electrostatic and electromagnetic waves.

This electrical interaction is to be computer-modeled based on measurements by instruments on the satellite, the Shuttle and on the ground. Such information is important in understanding such basic processes in space as radio waves detected by astronomers, electrical power generation in space and potential plasma effects on large space structures such as the Space Station.

The four other American principal investigators, their experiments and organizations are: Dr. Peter M. Banks, Shuttle Electrodynamic Tether System Using Orbiter-Mounted Sensors, Department of Electrical Engineering, Stanford Univ., Stanford, Calif; Dr. Gordon E. Gullahorn, Investigation of Dynamic Noise in the TSS, Smithsonian Astrophysical Observatory, Cambridge, Mass.; Dr. Adam T. Drobot, Theory and Modeling in Support of Tether Scientific Applications, International Corp., McLean, Va.; and Dr. Robert D. Estes, Investigation of Electro-Magnetic Emissions from the Electrodynamic Tether Using Ground-based ULF and VLF Measurements Smithsonian Astrophysical Observatory, Cambridge, Mass.

In addition to the American scientists, five Italian scientists also have been selected by PSN to participate in this project. They are: Dr. Silvio Bergamaschi, Theoretical and Experimental Investigation of TSS Dynamics, University of Padova,

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Padova, Italy; Dr. Marino Dobrowolny, Research on Electrodynamic Tether Effects Using Satellite-Mounted Sensors, National Research Center (CNR), PSN, Frascati, Italy; Dr. Franco Mariani, Magnetic Field Experiment for the TSS Missions Using Satellite-Mounted Sensors, CNR, PSN, Frascati, Italy; Dr. Giorgio Tacconi, Detection of Earth's Surface of ULF/VLF Emissions by TSS Using Ground-based Measurements, University of Genova, Genova, Italy; and Dr. Carlo Bonifazi, Italian Core Equipment (both orbiter-and satellite-mounted) CNR, PSN, Frascati, Italy.

The Investigator Working Group, comprised of the project's investigators and experimenters, is co-chaired by Dr. Stone and the Italian project scientist, Dr. Dobrowolny.

-end-

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National Aeronautics and
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For Release:

April 24, 1987

RELEASE NO: 87-62

NASA'S MARSHALL CENTER ISSUES REQUEST FOR PROPOSAL FOR SPACE STATION

One of the last major steps toward initiation of the design and development of the Space Station was taken this week when NASA's Marshall Space Flight Center, Huntsville, Ala., issued its "request for proposal" today.

The request invites companies to explain in detail precisely how they would design and develop the Marshall-managed aspects of the permanently manned station, planned for operation in orbit in the mid-1990's. Three other NASA centers also issued requests for proposals for the portions of the Space Station they manage.

"The release of the request for proposal marks a highly important milestone," said Luther Powell, manager of Marshall's Space Station Projects Office. "We look forward to construction of the station within the next few years, and to the benefits it will offer in the decades to come."

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Boeing and Martin Marietta are two competitors for the Marshall portion of the full Space Station development effort. Both companies have accomplished preliminary definition and design studies for the Marshall Center during the past two years.

A total of four "work packages" has been assigned to four NASA Centers, each with its own responsibilities for the station. The Marshall Center's area, known as "Work Package One," consists of responsibility for such elements as all of the U.S.-provided modules, which include the living quarters, one of the laboratories and a logistics module; the environmental control and life support system; the interconnecting node structure between the modules; and the internal thermal and internal audio-video systems.

The European Space Agency and Japan also are providing one laboratory module each, and Canada is providing a mobile servicing system.

The U.S.-provided laboratory will be devoted to microgravity research, primarily in the areas of materials processing and life sciences, as will be the European and Japanese laboratories.

Responses to the Marshall request are due July 21 to the space center, which will then review the proposals and present to NASA Headquarters in Washington the findings. NASA Administrator Dr. James Fletcher will make the final selection, and the contractor is expected to start work in November.

-more-

The Johnson Space Center in Houston is responsible for the external structure of the Station and major subsystems, such as data management; external thermal; external communications; guidance, navigation and control; and outfitting of the nodes. The Goddard Space Flight Center in Greenbelt, Md., is responsible for the free flying solar platform, satellite servicing and the external attached-payload interfaces. The Lewis Research Center in Cleveland is responsible for the power system.

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National Aeronautics and
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For Release:

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April 28, 1987
11 a.m. CDT

RELEASE: 87-65

MARSHALL CENTER CONTRACTOR SELECTED FOR EXCELLENCE AWARD

Martin Marietta Michoud Aerospace of New Orleans, La., has been selected as one of the first two NASA contractors to receive the NASA Excellence Award for Quality and Productivity for 1986. The announcement was made by Dr. James C. Fletcher, NASA administrator, at the annual meeting of the American Institute of Aeronautics and Astronautics in Arlington, Va.

(MORE)

Martin Marietta operates, under a contract with NASA's George C. Marshall Space Flight Center at Huntsville, Ala., the Michoud Assembly Facility at Michoud, La., the site where the Space Shuttle's external fuel tanks are manufactured.

The other NASA contractor to be honored was International Business Machines' Federal Systems Division, Houston, Texas. Both were selected for their exemplary standards in the products or services they provided.

In his keynote address, Dr. Fletcher said, "President Reagan has made improved productivity and quality a major thrust in our national efforts to maintain world competitiveness. The 1986 recipients of the NASA Excellence Award can be proud that their work is helping to achieve that goal."

Martin Marietta and IBM were selected from among seven finalists. They were judged on their measurable and verifiable accomplishments in quality and productivity, employing factors such as product and/or service performance, attainment of cost and schedule objectives, and comprehensive reporting and communication systems. NASA will highlight the award recipients throughout the year in two or more NASA-sponsored seminars and conferences conducted by George Rodney, associate administrator for safety, reliability, maintainability and quality assurance, and C. Robert Nysmith, director of productivity programs.

(MORE)

In addition to IBM and Martin Marietta, other finalists included Boeing Computer Support Services, Inc., Huntsville; Calspan Corp., Moffett Field, Calif.; Lockheed Engineering and Management Services Co. Inc., Houston; Rockwell International Rocketdyne Division, Canoga Park, Ca.; and Spar Aerospace Ltd., Remote Manipulator Systems Division, Ontario, Canada.

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National Aeronautics and
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May 21, 1987

RELEASE NO: 87-72

FULL-SIZE SHUTTLE ROCKET MOTOR TO BE TEST FIRED

Morton Thiokol's Space Division, NASA's prime contractor for the Space Shuttle solid rocket motors, is scheduled to test fire the first in a series of full-size motors May 27 at 1 p.m. MDT at its Wasatch Operations site in Utah. The test is part of the Shuttle motor redesign program.

This will not be the configuration of the motor which is to be used on the next Shuttle flight, but it will provide data to evaluate materials and engineering concepts which could ultimately be incorporated in the redesigned Shuttle solid rocket motor. The extensively instrumented 126-foot long, 1.2 million-pound Engineering Test Motor (ETM-1A) will undergo a full-duration (120 seconds) horizontal test firing.

The ETM-1A test will be the first full-size, full-duration test firing of a Shuttle motor since May 1985. The case segments and internal insulation for the motor are the same type used on previous Shuttle flights. The first full-duration test of a

-more-

redesigned motor, which will include the capture feature and third O-ring, will be in August when Development Motor-8 (DM-8) is test fired.

Although the ETM-1A case segments are of the original configuration, there have been changes incorporated into the motor. The two forward field joints have original Viton (TM) O-rings, but external graphite reinforcing bands have been added to those joints. The aft field joint will incorporate one Viton and one silicone O-ring, and will be fitted with an external tank attachment ring. All three joints will be equipped with a wrap-around electrical joint heater. This will be the first full-size static firing test to incorporate graphite overwraps, joint heaters and external tank attach ring. In addition, several improvements in nozzle construction and assembly will be tested; the motor and the nozzle specifically are heavily instrumented to acquire engineering data.

Morton Thiokol is NASA's prime contractor for the motors, and the Marshall Space Flight Center in Huntsville, Ala., manages the motor program for NASA.

ETM-1A FACT SHEET

BACKGROUND:

The ETM-1A Engineering Test Motor was scheduled for firing in late March. That motor incorporated non-flight internal insulation features called U-seals, which were to be tested for evaluation as an interim step leading to the eventual flight J-seal configuration. The ETM firing was postponed when bonding problems with the U-seal were suspected.

The bonding problem came to light during disassembly of a short-duration test motor (Joint Environment Simulator-2B, fired on Feb. 23) that contained a similar U-seal joint. When the forward field joint of that motor was taken apart during the week of March 1, it was discovered that manufacturing flaws in the secondary bond between the U-seal and the case insulation had permitted hot gases to penetrate part way to the case wall.

Because the same bonding flaws potentially existed in the ETM, NASA and Morton Thiokol decided to disassemble the motor and replace the two center segments (those containing the U-seal) with segments of the original joint design. The igniter, forward and aft motor segments, aft skirt and nozzle assembly are those originally assembled into the ETM. The motor reconfiguration is not expected to have any effect on either subsequent test firings or on the tentative launch schedule.

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ETM-1A TEST OBJECTIVES:

The seven major test objectives for ETM-1A are to evaluate:

- Motor pressure rise rate
- New seal materials
- Effectiveness of composite (graphite) overwrap
- Performance of joint heater system
- Structural integrity of external tank attach ring
under motor pressurization loads
- Performance of new nozzle nose-inlet rings
- Backfill effectiveness for nozzle exit cone field joint

ETM-1A CONFIGURATION:

ETM-1A is a full-size Space Shuttle solid rocket motor, approximately 126 feet in length and 12 feet in diameter. The motor weighs 1,256,987 pounds, of which 1,109,542 pounds is propellant. The three field joints which connect the four casting segments are of the original tang and clevis design flown on previous Shuttle missions. The small gap between mating insulation surfaces at each field joint is filled with a zinc chromate putty. A standard aft skirt containing thrust vector control equipment and a standard exhaust nozzle are fitted to the motor.

For this test, the two forward field joints will be identically configured. The joints will contain Viton (TM)

-more-

primary and secondary O-rings and will be fitted with an external electrical joint heater and graphite overwrap bands on tang and clevis sides of each joint. Each joint heater contains two independent circuits and will be thermostatically controlled to maintain joint temperatures at a minimum of 75 degrees F.

The graphite overwrap bands serve to restrict case rotation under firing pressure, and represent a possible alternative to the baseline capture feature case design. This will be the first full-duration motor test with heaters and graphite overwraps installed on a 51-L configuration case. Both features have been tested in non-firing tests.

The aft field joint on ETM-1A will also be of the 51-L metal configuration with putty and external heater, but will be fitted with a Viton primary O-ring and a silicone composition secondary O-ring. An extensively instrumented external tank attach ring will be mounted on the case just aft of this joint as in flight configuration. This will also be the first full-duration test with an external tank ring attached.

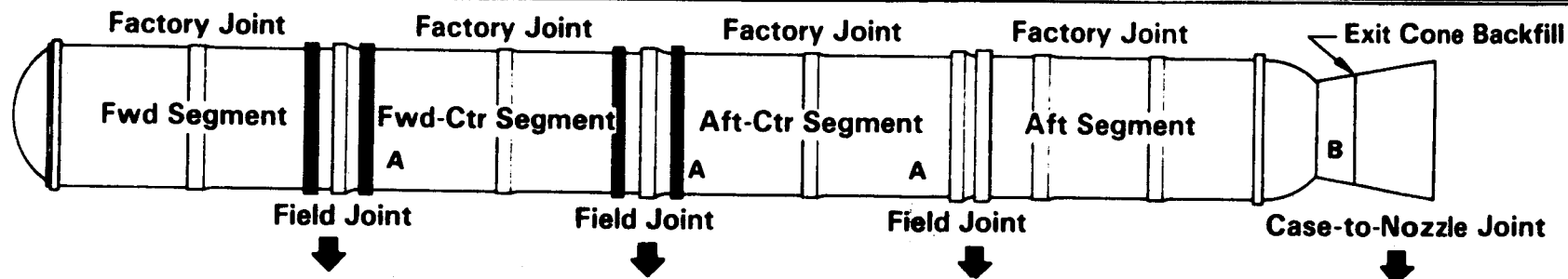
The motor case-to-nozzle joint on ETM-1A will likewise be of the 51-L configuration, to include standard internal insulation and vacuum putty. For this test, the joint will include an Arctic Nitrile (TM) primary O-ring and a Viton secondary O-ring seal.

One nozzle feature being tested on ETM-1A is ply-angle changes on the forward nose and aft inlet portions of the exhaust nozzle. Ply-angle refers to the angle at which composite tape is wound onto a shaped mandrel during nozzle manufacture. Changed

ply-angles are expected to provide better control of nozzle material erosion during firing. The other feature to be tested is a backfill technique for applying sealant into the nozzle exit cone attachment joint.

The ETM-1A motor is fitted with 400 instruments (87 pre-fire only) to measure acceleration, pressure, deflection, thrust, strain, temperature, electrical and other conditions.

ETM-1A Motor Configuration



• All field joints

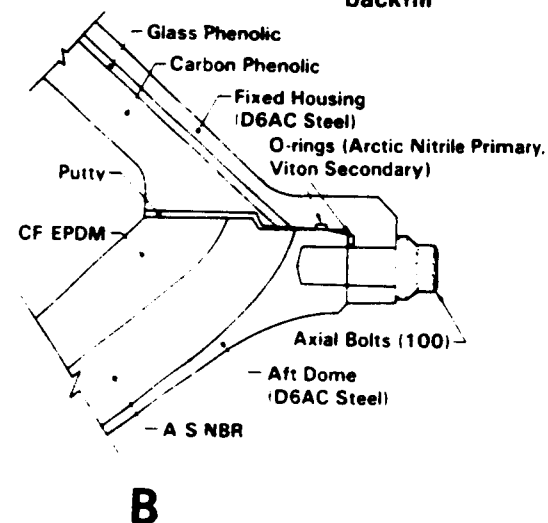
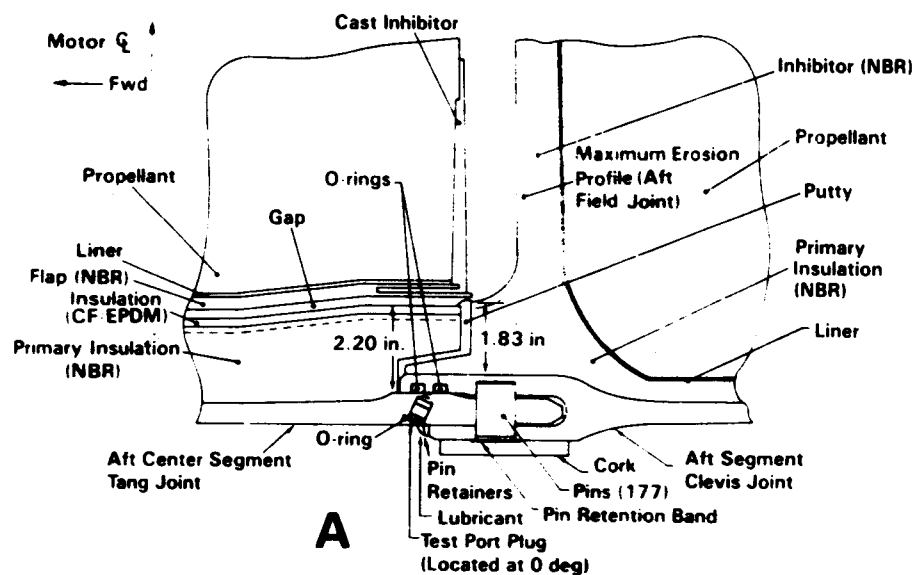
- Longer pins
- Steel bands
- Retainer guides
- Custom shims

- 51-L configuration
- Vacuum putty joint filler
- Viton primary seal
- Viton secondary seal
- Joint heater (75°F min)
- Graphite overwrap

- 51-L configuration
- Vacuum putty joint filler
- Viton primary seal
- Viton secondary seal
- Joint heater (75°F min)
- Graphite overwrap

- 51-L configuration
- Vacuum putty joint filler
- ET attach ring
- Viton primary seal
- Silicone secondary seal
- Joint heater (75°F min)

- 51-L configuration
- Vacuum putty joint filler
- Arctic nitrile primary seal
- Viton secondary seal
- Temperature control to min of 50°F
- Exit cone field joint backfill



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National Aeronautics and
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For Release:

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May 28, 1987

RELEASE NO: 87-73

ZOLLER TO MANAGE ADVANCED SOLID ROCKET MOTOR STUDIES

Lowell K. Zoller has been named to manage Advanced Solid Rocket Motor study activities for the Marshall Space Flight Center in Huntsville, Ala.

Zoller was appointed to the post May 22 by Marshall Center Director J.R. Thompson, who said Zoller would be supported by other elements of the Center's Space Shuttle Projects Office and the Program Development Directorate as appropriate.

Zoller has been manager of Marshall's Systems Management Office in the Shuttle Projects Office since 1982.

He participated in the initial Shuttle vehicle development effort and was formerly deputy manager of the External Tank Project Office. He served as manager of the Materials Processing

- more -

in Space Projects Office from October 1978 when the office was established until he received his current appointment in 1982.

"The Advanced Solid Rocket Motor program is important to the Agency objectives of improved flight performance, reliability and flight safety. Mr. Zoller's technical expertise and extensive project management experience make him well qualified to manage this significant activity," Thompson said.

The Advanced Solid Rocket Motor Program will begin with the awarding of up to five Phase B engineering definition and supporting study contracts. A decision to pursue the design, development, test and production of the ASRM could be made based on the results of the Phase B study activity.

Zoller is a native of Fort Wayne, Ind. He and his wife now reside in Huntsville.

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National Aeronautics and
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George C. Marshall Space Flight Center
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For Release
May 28, 1987

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Jim Sahli
Marshall Space Flight Center, Huntsville, Ala.
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RELEASE NO: 87-75

MARSHALL CENTER ISSUES RFP FOR LIQUID-FUELED ROCKET BOOSTER STUDIES

NASA's Marshall Space Flight Center in Huntsville, Ala., today issued a request for proposals for system studies and design concepts of liquid-fueled rocket boosters for possible use on the Space Shuttle and future vehicles.

L.T. Spears and Michael R. Moore of Marshall's Advanced Projects Office indicate nine-month-long multiple studies of both pressure-fed and pump-fed liquid-fueled rocket boosters could begin as early as this summer.

The overall liquid rocket booster study also involves several other NASA centers, including Johnson Space Center, Houston; Kennedy Space Center, Fla.; and Langley Research Center, Hampton, Va. Johnson will evaluate the effects of liquid rocket boosters on the overall flight characteristics of

-more-

boosters on the overall flight characteristics of the Space Shuttle. Kennedy will analyze the integration requirements of liquid rocket boosters on launch facilities. Langley will assist in aerodynamic analyses and evaluation of wind tunnel tests of Space Transportation System/liquid rocket booster concepts.

-end-

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National Aeronautics and
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For Release

June 3, 1987

RELEASE NO: 87-76

MANAGEMENT APPOINTMENTS ANNOUNCED FOR MICHLOUD

John W. Hill of Bay St. Louis, Miss., has been appointed manager of NASA's Michoud Assembly Facility in New Orleans, and John R. Demarest of New Orleans has been appointed deputy manager.

The primary mission of Michoud is the systems engineering, engineering design, manufacture, fabrication, assembly and related work for the Space Shuttle External Tank. The New Orleans facility is part of NASA's Marshall Space Flight Center in Huntsville, Al., which announced the appointments this week.

Hill, a native of New Albany, Miss., is a veteran of the Army Ballistic Missile Agency who joined the Marshall Center when it was formed in July 1960.

He was reassigned to the Engine Office at Michoud Operations in 1963 during the time the facility was producing Saturn launch vehicles.

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He was named chief of the Engine Office in 1966 and served as chairman of the Michoud Utilization Study Group in 1969.

In 1975, he was named chief of the External Tank Production Office and subsequently became manager of the External Tank Resident Office there. In Nov. 1983, he became deputy manager of the Michoud Assembly Facility.

Demarest, a native of New Orleans, joined the Michoud Assembly Facility in 1963 as an aerospace engineer. He has since served in various key positions at Michoud including work in the Office of the Assistant to the Manager for Quality Assurance and Reliability. He has served as chief of the Michoud Resident Branch of the Marshall Center's Facilities Office, responsible for planning, directing and coordinating facilities operations at Michoud since 1975.

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June 3, 1987 For Release

RELEASE NO: 87-77

MARSHALL CENTER ISSUES REQUESTS FOR ADVANCED SOLID ROCKET MOTOR STUDIES

NASA's Marshall Space Flight Center in Huntsville, Ala., has invited industry to compete for design and definition study contracts for an Advanced Solid Rocket Motor for the Space Shuttle. Work to be done under the study contracts was outlined in requests for proposals issued today.

The decision to pursue the advanced motor studies, called "Phase B," was announced in April by NASA Administrator Dr. James C. Fletcher.

Proposals for the nine-month long studies are due at the Marshall Center July 6. Based on the proposals received, up to five contractors will be selected to perform the studies, with fixed-price contracts expected to be awarded in August. The estimated cost for the total Phase B effort will be about \$15 million.

Companies selected for the contracts will be required to develop preliminary Advanced Solid Rocket Motor designs with supporting design analyses, conduct detail design assessments to

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increase solid rocket motor reliability and performance, and evaluate incremental advanced motor changes that would permit Space Shuttle performance increases up to 12,000 pounds of payload.

The preliminary designs will include both a segmented motor design, like the current Shuttle motors, and a monolithic motor design, wherein the full-length motor case is assembled and the propellant is cast without joints.

The Phase B studies follow completion of a "Phase A" activity in which five aerospace firms performed conceptual studies of alternative solid rocket motor designs. Those companies were Aerojet Strategic Propulsion Co., Sacramento, Calif.; Atlantic Research Corp., Alexandria, Va.; Hercules Aerospace Company's Aerospace Div., Salt Lake City, Utah; Morton Thiokol Corporation's Wasatch Operations, Brigham City, Utah; and United Technologies, Chemical Systems Division, San Jose, Calif. The Phase A contracts, also managed by the Marshall Center, were initiated in September 1986 and completed in December.

A decision to pursue a "Phase C/D" effort -- design, development, test and production -- for an Advanced Solid Rocket Motor could be made, based on the results of the Phase B activity, by proposing a "new start" in the fiscal year 1989 budget process. If a decision is made to proceed with a Phase C/D effort, it is anticipated that the advanced motor could be available in late 1993.

NASA News

National Aeronautics and
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For Release
June 4, 1987

RELEASE NO: 87-78

MARSHALL SCIENTISTS LAUNCH SUPERNOVA BALLOON DOWN UNDER

Scientists from the Marshall Space Flight Center in Huntsville, Ala., after months of preparation, have launched a high-altitude balloon experiment at Alice Springs, Australia.

The NASA team, in collaboration with Lockheed's Palo Alto Laboratory, are "down under" to learn more about possible gamma ray emissions from Supernova 1987a, the nearest such star explosion to the Earth since 1604.

Dr. Gerald J. Fishman of Marshall's Space Science Laboratory, who is leading the NASA team, launched the experiment from Alice Springs May 30 to study the star explosion which was first detected by astronomers on Feb. 24.

The balloon flight lasted just one day and drifted 700 miles to the east landing near Carlton, Australia, said Dr. Thomas A. Parnell, chief of the High Energy Astrophysics Branch at Marshall.

-more-

The 20-story-tall, helium-filled balloon carried the experiment package above most of the Earth's atmosphere to a height of 122,000 feet. Then, its instruments were pointed at the supernova to detect any possible gamma ray emissions. It also was pointed at the Crab Nebula, a remnant of a supernova that occurred in the 1500's which is a known gamma-ray emitter.

"Our crew in Australia is very happy with the successful flight of the experiment. Although initial indications are that there was no obvious gamma radiation from the supernova, it will take a couple months of analysis before we know conclusively what our experiment discovered," said Parnell. "Our team feels they have significant information to study the supernova," he said.

"Gamma rays can't penetrate the Earth's atmosphere. That's why we have to use high-altitude balloons to study them," Fishman said prior to leaving for Australia May 7.

Lockheed is providing the sensitive gamma-ray detector, while Marshall Center is supplying the gondola which carried 3,000 pounds of scientific equipment.

The supernova, located about 155,000 light years away, is at a declination of 69 degrees south and can only be observed in the southern hemisphere. A single light year, the distance light travels in a year, equals 6.6 trillion miles.

NASA's Deep Space Network station near Canberra, Australia, configured with Australia's Parkes Radio Observatory has been observing the radio wave emission from the supernova.

-more-

In addition to Marshall's balloon launch on May 30, two other NASA sponsored balloon experiments are being conducted at Alice Springs.

On May 20, a California Institute of Technology scientific team launched the first NASA-sponsored balloon flight. Still to be launched is a balloon experiment by Bell Laboratories and Sandia National Laboratory.

The Marshall scientific team left the United States May 7 and plans to return the week of June 8.

Members of the Australian expedition from Marshall include: Dr. Fishman, Dr. Charles A. Meegan, W. Thomas Sutherland, and Robert W. Austin.

NASA News

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For Release:

June 8, 1987

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(Phone: 202/453-8400)

RELEASE NO: 87-79

REPLACEMENT ORBITER TO BE NAMED BY STUDENTS

Dr. James C. Fletcher, administrator of NASA, today announced a program under which students will recommend names to NASA for the Space Shuttle orbiter to replace the Challenger. NASA will make the final selection.

Under the program students of a classroom or school will undertake an educational research project to arrive at a name. The program is designed to permit the involvement of a school system or an entire community. It will be open to all 50 states, U.S. territories, Department of State overseas schools and the Bureau of Indian Affairs.

"Through the program, students, teachers and parents will learn more about the technology that affects all of our lives" Fletcher said. "It is fitting that students and teachers who shared in the loss of the Space Shuttle Challenger, share in the creation of its replacement."

The NASA Headquarters Educational Affairs Division will be responsible for the formation and management of the program. The contest will be held during the 1988-89 school year. Details on the application process are expected in spring 1988.

House Joint Resolution 559, introduced on May 10, 1986, by Congressman Tom Lewis (R-Florida) called for the name of any replacement orbiter be selected from suggestions submitted by students.

- end -

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NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Jim Sahli
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For Release:
June 9, 1987

Release No: 87-80

MARSHALL CENTER ENGINEER DR. JAN DOZIER SELECTED BY NASA AS ASTRONAUT CANDIDATE

Dr. Jan D. Dozier, an aerospace engineer and team leader in the Structures and Dynamics Laboratory of NASA's Marshall Space Flight Center in Huntsville, Ala., Friday became the first employee in the Center's 27-year history to be selected as a career astronaut candidate for Space Shuttle flight crews.

Dozier, 33, who was selected as a mission specialist candidate, was one of 14 new astronaut candidates who will report to the Johnson Space Center in Houston on Aug. 17 to begin a year-long program of training and evaluation.

"It was a dream come true," Dozier said after learning that she had been selected. Her application was one of 1,962 that NASA received. Out of that group, 117 persons were interviewed and given medical examinations at Johnson.

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Following Friday's announcement regarding Dozier, Center Director J.R. Thompson said, "I know that I echo the thoughts of all of us at Marshall in stating how proud we are of the selection of Jan Dozier as one of a select few of NASA's newest astronaut candidates. It is a great choice, and Jan will do a super job. We will all follow her astronaut career closely and wish her the very best."

Dozier, who was born in Cocoa Beach, Fla., joined the Marshall Center in 1979 and has been actively involved in the development of the Marshall-managed Hubble Space Telescope, the Advanced X-Ray Astrophysics Facility and some solid rocket booster components for the Space Shuttle.

Regarding her career as a future astronaut, Dozier said, she hopes to someday be associated with a mission involving the Hubble Space Telescope. "My first choice would be the Space Telescope without a doubt. If I can't get on a deployment mission, I would like to get on a maintenance and refurbishing one."

Expressing her thanks to the employees at Marshall who have supported her in her quest to become an astronaut, Dozier said Monday, "I just want to share this (her selection) with everybody here at Marshall and in Huntsville. They are all a part of it."

She said she felt "the technical experience that I have gained here at Marshall" will be the strongest asset she will contribute as a career astronaut.

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"I grew up here in Huntsville knowing (Dr. Wernher) von Braun and a lot of the scientists that came with him. I went to school with a lot of their children. I was here when they were doing a lot of (Saturn rocket) testing, and shaking the whole town. It's always been a part of my life."

Dozier graduated from Huntsville High School in 1971. She received a B.S. degree in bio-mechanics from Georgia Tech in 1975 and a B.M.E. degree in mechanical engineering from Auburn University in 1977.

She completed work on an M.S.E. degree in mechanical engineering at the University of Alabama in Huntsville in 1983 and a Ph.D. degree in mechanical engineering at UAH in 1985.

Before she joined NASA, Dozier was a petroleum engineer in Texas. She is on the Structures Technical Committee for the American Institute of Aeronautics and Astronautics and a member of the American Society of Mechanical Engineers Operating Board. She is also a member of the Omicron Delta Kappa leadership honorary society, the Tau Beta Pi engineering honorary society, and the Alpha Xi Delta social sorority.

Her parents are Bryce and Dolly Davis of Huntsville.

Out of the astronaut candidates named by NASA Friday seven are pilot astronaut candidates and eight are mission specialist candidates.

The candidates included five civilians and 10 military officers. Two of the mission specialist candidates are women,

-more-

including one minority. Three of the civilian mission specialist candidates are current employees of the Johnson Space Center.

In addition to Dozier, two other candidates with Alabama connections were also named by NASA. They are Dr. Mae C. Jemison, a native of Decatur, who now lives in Los Angeles, Calif., and Army Major James S. Voss, who was born in Cordova, Ala., and is now an engineer at Johnson.

The military candidates include four from the Air Force, three from the Navy, one from the Marine Corps, one from the Coast Guard -- the first ever from that organization -- and one from the Army.

Candidates from the Air Force are Capt. Thomas D. Akers; Capt. Curtis L. Brown Jr.; Major Kevin P. Chilton; and Major Donald R. McMonagle.

Those from the Navy are Lt. Kenneth D. Bowersox, Lt. Cmdr. Kenneth S. Reightler Jr., and Lt. Cmdr. Mario Runco Jr.

Other military candidates are Marine Capt. Andrew M. Allen, Army Major Voss, and Coast Guard Lt. Cmdr. Bruce E. Melnick. In addition to Dozier and Jemison, the civilians are C. Michael Foale, Gregory J. Harbaugh and William F. Readdy.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release

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June 17, 1987

RELEASE NO: 87-83

MARSHALL CENTER WELCOMES 36 SUMMER FACULTY FELLOWS

The twenty-third annual Summer Faculty Fellowship Program is underway at the Marshall Space Flight Center in Huntsville, Ala.

The program is providing 36 college and university educators the opportunity to work on joint research projects this summer with their professional peers at the NASA center.

Sponsored jointly by NASA and the American Society for Engineering Education, this year's program participants represent 20 universities in 11 states. The 36 fellowship recipients were selected from a group of 115 applicants.

The program is designed to give college and university faculty members a rewarding personal experience as well as profitable professional experience during their 10 weeks at the Marshall Center, according to Ernestine Cothran, assistant for university affairs at the center.

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"Every year participants tell us that one of the best benefits the program offers is the opportunity to work side by side with their colleagues at Marshall," Cothran said.

This year's participants have received assignments in all seven Marshall Center laboratories within the Science and Engineering Directorate, the Program Development Directorate and the Public Affairs Office.

Dr. Gerald Karr, chairman of the Mechanical Engineering Department at the University of Alabama in Huntsville, is the university program director for this year's program.

Of the 36 fellowship recipients selected for the program this year, 23 are participating for the first time.

First year fellows and the schools they represent are Dr. Jean A. Blake, Alabama A&M University; Dr. Albert T. Fromhold, Auburn University; Dr. William P. Schonberg, the University of Alabama in Huntsville (UAH); Dr. Dennis S. Tucker, Georgia Tech; Dr. Daniel W. Walsh; California State Polytechnic University; Dr. Chester C. Carroll, University of Alabama; Dr. Stephen A. Floyd, UAH; Dr. Alexander Bykat, University of Tennessee, Chattanooga; Dr. Enoch C. Temple, Alabama A&M.

Dr. Gary H. McDonald, University of Tennessee, Chattanooga; Dr. Douglas I. Ford, LeTourneau College, Texas; Dr. Samuel S-M Han, Tennessee Technological University, Cookeville; Dr. Amar Choudry, UAH; Dr. Richard A. Zalik, Auburn; Dr. William T. Springer, University of Arkansas; Dr. Stephen C. McGuire, Alabama A&M; Dr.

Anny Morrobel-Sosa, University of Alabama; Dr. James D. Patterson, Florida Tech.

Dr. J. Milton Harris, UAH; Dr. Dorian P. Yeager, University of Alabama; Dr. Edward L. Bosworth, UAH; Dr. Robert E. Bozeman, Morehouse College; and Dr. Rajinder S. Chauhan, North Carolina A&M.

Returning fellows and the schools they represent are: Dr. Robert G. Batson, University of Alabama; Dr. Frank Swenson, Tri-State University, Indiana; Charles P. Callis, University of Tennessee, Martin; Dr. Richard A. Anderson, University of Missouri; Dr. Joey K. Parker, University of Alabama.

Dr. Howard L. Brooks, Depauw University, Indiana; Dr. Stephen D. Baker, Rice University, Texas; Dr. Gene G. Byrd, University of Alabama; Mary E. Prince, UAH; Dr. Mark V. Bower, UAH; Dr. Fat Duen Ho, UAH; Dr. Arthur R. Knoebel, New Mexico State University; Dr. Esther Gill, Oakwood College, Huntsville.

NASA News

National Aeronautics and
Space Administration

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June 18, 1987

Leon Perry
NASA Headquarters
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RELEASE NO: 87-84

NOTE TO EDITORS/NEWS DIRECTORS

NASA's Office of Space Science and Applications, Life Sciences Division, Washington, D.C., will sponsor the first space life sciences symposium, June 21-26, 1987, at the Omni Shoreham Hotel, Washington, D.C.

Called "Three Decades of Life Sciences Research in Space", the conference will address a variety of topics including advanced space missions and life sciences; closed ecological life support system; space biology: "Its Future Direction and Potential"; Earth system science: "A Program for Global Change"; and NASA's exobiology program.

Copies of the symposium agenda will be available at the Marshall Center Public Affairs Office starting June 19.

Selected highlights of the symposium will be broadcast on NASA Select TV, Satcom F2R, transponder 13, 72 degrees w. longitude, 3960.0 Mhz, audio 6.8 Mhz.

Media desiring to view the symposium events at the Marshall Center should call the Public Affairs Office, 544-0034, to make necessary arrangements.

Symposium events carried live on NASA Select TV include (all times are CDT):

Monday June 22, 1987

Opening session

7:30 a.m. - 10:30 a.m.

Dr. Nicogossian, Dr. Ride, Adm. Truly and Dr. Martin

LIVE

Tuesday June 23, 1987

Panel discussion

9:45 a.m. - 11:00 a.m.

LIVE

Soviet session

1:00 - 3:00 p.m.

LIVE

Wednesday June 24, 1987

Dr. Bretherton

10:30 a.m. - 11:15 a.m.

LIVE

-----TAPED ONLY-----

Monday June 22, 1987

Banquet

Dr. Tom Paine

7:30 p.m.

Thursday June 25, 1987

Dr. Carl Sagan

6:00 p.m. - 8:00 p.m.

-end-

NASA News

National Aeronautics and
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For Release
June 24, 1987

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RELEASE: 87- 86

NEW TECHNOLOGY AIDS IN DETECTION OF EYE DISORDERS

Two years ago Lance Bolt was much like any other 6-year-old, except that he was in danger of forever losing sight in one eye. Lance had amblyopia. Commonly referred to as "lazy eye," it can lead to permanent blindness in the affected eye if not detected and corrected early in a child's life. For Lance, the clock was running out, and no one knew about it.

But today, Lance is doing fine, thanks to a new mass vision screening system for children, perfected by NASA's Marshall Space Flight Center in Huntsville, Ala., and an Alabama-based small business. The system was developed as part of a NASA program established specifically to share its space technology and expertise with private industry.

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Called the Photorefractor Ocular Screening System, the device is a portable unit that detects eye problems in children through a photometric analysis of retinal reflexes. "Put simply, we take a color photograph of the child's eyes," explained John Richardson, a member of Marshall Center's Technology Utilization Office and a key figure in the development of the system. "Then, by analyzing the photo, we can detect multiple vision problems."

By studying a single photograph of a child's eyes, experts can easily detect defects, including: myopia (nearsightedness); hyperopia (farsightedness); obstructions in the lens, including cataracts; alignment differences between the eyes; and amblyopia.

"The system has many advantages. It's fast, it's safe and it's painless," explained Richardson. "You can screen one child every 30 seconds. At one elementary school, we tested more than 600 students in a single day. No drugs are required to dilate the child's pupils, and no instrument touches the student's eyes.

"Most important, perhaps, is that the method is effective. We have found that 20 percent of all the children we have tested to date have had some kind of previously undetected ocular abnormality. And half of those abnormalities were significant enough to require the attention of an eye specialist," Richardson explained.

The new system also is nearly fool-proof. Richardson recalls one child with an apparent, but unattributable, learning problem who had been screened several times using the more traditional eye chart method.

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He repeatedly tested fine. When screened by the new system, he was found to have a pronounced vision problem. It seems that the child thought he was supposed to pass all his tests in school. So, he simply studied hard -- and memorized the eye charts.

Experts believe that early detection and correction of vision problems in children is important because these problems can lead not only to blindness, but may lead to learning deficiencies as well. The new system is extremely valuable in testing young children -- 6 months to 2 years old -- who can't yet talk. It also is valuable in testing other non-communicative children including those who are deaf/mute.

The system is more useful with children, because their eyes dilate more readily than those of adults, which makes it easier to detect small refractive errors. However, it can be used for mass screening of adults for certain problems. For example, it could be used periodically in an industry where adults are exposed to cataract-causing microwaves.

NASA got involved in the project about eight years ago. An Alabama ophthalmologist wanted to experiment with a photographic technique to detect eye problems. Photography had been used by a doctor in Finland for some time, but with only limited success. So, the local ophthalmologist contacted Joe Kerr, a former NASA employee, who in turn contacted Richardson for help.

"It's our job in the Technology Utilization Office to facilitate the transfer of space technology and expertise to the

-more-

commercial sector," explained Richardson. "We brought the same NASA engineering and management expertise we apply to the space program to bear on this problem." What ultimately evolved was a patented reliable, compact and portable system that is now in exclusive commercial use by Kerr's Medical Sciences Corp.

The system basically consists of a 35mm camera, a telephoto lens, an electronic flash unit, a head positioning station and an alignment structure. Testing is done in a darkened room to allow the child's pupils to dilate.

The child then looks through a slotted alignment window at a blinking red light positioned above the camera and the photo is taken. Experts later study the picture to analyze how the light from the strobe is reflected and refracted through the child's eyes which enables them to identify abnormalities.

They not only can identify, but can calculate the amount and type of refractive error. By taking a photograph of a child wearing glasses or contact lenses, it even can be determined if the corrective lenses are the right prescription.

The development was evolutionary, according to Richardson. Engineers tested several systems and made improvements along the way. As part of the development, they even looked at employing some interactive data processing system technology once used to analyze photo images taken during the Skylab space station program. However, they found that it was just as effective to analyze the photos visually.

The system was first field tested at the Alabama School for the Deaf. The system was later used by the Huntsville Lions Club

to screen 1,800 kindergarten and first grade students. This effort revealed more than 500 students with potential vision problems. University of Alabama researchers also are using the system to test a select group of learning disabled students in an attempt to study relationships between eye abnormalities and learning disabilities.

And today, Kerr's Wedowee, Alabama-based company has a contract with Kinder-Care Learning Centers, Inc., to provide vision screening for children in 1,025 Kinder-Care centers throughout the United States and Canada.

To date more than 20,000 children have been screened. And statistics show that the system is working well. The newest version of the instrument is about 95 percent accurate and that pleases co-inventors Joe Kerr and John Richardson.

But to them, probably the most rewarding aspect of the effort has been the response from parents of the children screened. "I have received many letters from parents of children who were identified as having vision deficiencies through the screening process, especially from parents of children with amblyopia. They are very appreciative," said Kerr.

But perhaps Lance's mother, Kim Craft, summed it up best. "This system saved my child's eyesight. He would have been blind in one eye if he had not been screened by the system." And it may never have happened had it not been for the cooperative effort between NASA and private industry.

NASA News

National Aeronautics and
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For Release

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June 26, 1987

David Garrett
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RELEASE: 87-87

EHL NAMED DEPUTY ASSOCIATE ADMINISTRATOR FOR SRM&QA

James H. Ehl, chief of the Process Engineering Division in the Materials and Processes Laboratory at the Marshall Space Flight Center in Huntsville, Ala., today was named Deputy Associate Administrator, Office of Safety, Reliability, Maintainability and Quality Assurance (SRM&QA), NASA Headquarters. The position is effective July 5, 1987.

Ehl joined the Marshall Center in 1960, working in the Manufacturing Engineering Laboratory, Process Engineering Division. In 1974 he transferred to the Materials and Processes Laboratory as the tooling application branch chief and later

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became chief of the Process Engineering Division.

Ehl has served on numerous source evaluation boards, boards of investigation and participated in many manufacturing and quality audits. He chaired the production readiness reviews for all major Marshall Space Transportation System contractors and has extensive experience in manufacturing methods and process engineering developments for the aerospace industry.

Ehl received a bachelors degree in mechanical engineering from Auburn University in 1958 and an MBA in 1973.

Ehl and his wife, Caryl, have a son and will reside in Falls Church, Va.

NASA News

National Aeronautics and
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For Release

July 2, 1987

Mark Hess
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RELEASE: 87-110

NASA SELECTS GRUMMAN FOR SPACE STATION PROGRAM SUPPORT CONTRACT

The National Aeronautics and Space Administration has selected Grumman Aerospace Corp., Space Station Program Support Division, Bethpage, N.Y., for negotiations leading to award of a cost-plus-award-fee Space Station Program Support Contract (PSC).

The contract provides for Space Station systems engineering and integration in addition to a broad base of management support to the Space Station Program Office.

The principal place of performance will be in the Washington, D.C. area. PSC field offices also will be located at participating NASA field centers -- Marshall Space Flight Center,

-more-

Johnson Space Center, Goddard Space Flight Center, Lewis Research Center and Kennedy Space Center -- in countries of foreign participants and at such other locations as may be required.

The contract period of performance will extend through the completion of assembly of the Space Station in orbit plus one year.

Grumman's proposed cost (in real year dollars) for the currently planned performance period of approximately 11 years is \$841 million, with a price option for additional support of \$406 million.

The PSC will provide support to the Space Station Program Office, to be located in Reston, Va., in the areas of systems engineering and integration; program control and management; information systems; operations; program requirements and assessment; utilization; safety, reliability and quality assurance; and international integration.

TRW, Space Station Services Division, Redondo Beach, Calif., was the only other company to submit a proposal.

NASA News

National Aeronautics and
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For Release

July 2, 1987

RELEASE NO: 87-88

LIQUID ROCKET BOOSTER TASK TEAM ESTABLISHED

James R. Thompson, director of the Marshall Space Flight Center in Huntsville, Ala., has announced the establishment of a Liquid Rocket Booster Task Team within the Advanced Projects Office of the Program Development Directorate.

Lawrence O. Wear, who has been serving as manager of the Solid Rocket Motor Alternate Source Project in the Shuttle Projects Office, has been appointed manager of the task team. Wear has served in other related assignments including: chief of the Solid Rocket Motor Office within the Solid Rocket Booster Project, and deputy manager of the Space Shuttle Main Engine Project.

According to Thompson, the new team's conceptual studies of liquid rocket boosters will complement the definition study under way with the Advanced Solid Rocket Motor Program.

(MORE)

The Marshall Space Flight Center in May issued a request for proposals for designs of liquid rocket boosters for possible use on the Space Shuttle and other future vehicles.

According to officials in Marshall's Advanced Projects Office, nine-month-long parallel studies of both pressure-fed and pump-fed liquid fuel rocket boosters should begin later this summer.

NASA News

National Aeronautics and
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For Release

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July 14, 1987

RELEASE NO: 87-89

MARSHALL AWARDS CONTRACTS FOR DEVELOPMENT OF MULTIPLE EXPERIMENT PROCESSING FURNACE

Marshall Space Flight Center in Huntsville, Ala., has awarded two contracts at an estimated cost of \$5 million to Teledyne-Brown Engineering, Huntsville, and Wyle Laboratories, Huntsville, to design and develop Multi-Experiment Processing Furnaces (MEPF) in "breadboard" or prototype form for evaluation regarding use on NASA's Space Shuttle and Space Station.

The furnaces are being developed for the NASA Commercial Utilization of Space Program. They will be designed to accommodate new investigations of basic studies and applications involving microgravity solidification of metals and semiconductor materials research.

The two furnaces will have different characteristics. The Teledyne-Brown furnace is an automated system and would fly in

-more-

the cargo bay of the Space Shuttle on a standard carrier system, the Materials Science Laboratory.

The Wyle furnace will be developed to fly in the Spacelab Man-Tended Module. It will be man-tended and will incorporate certain advanced technical features.

Teledyne-Brown Engineering and Wyle Laboratories contracts will be for approximately \$2.5 million dollars each. The contracts were signed in June and will last 17 months, said Marshall procurement officials.

Each contract includes two options: option I for fabrication, testing and delivery of a flight-ready furnace and option II for fabrication, testing and delivery of an identical furnace.

"Currently, we have limited capabilities on our flight furnaces and we can only accommodate a few microgravity experiment samples per flight. With these furnaces, we will be able to more productively use our flight opportunities by processing at least 20 experiment samples per flight, and heat the materials to a higher temperature than most previous devices," said Roger Chassay of Marshall's Microgravity Projects Office.

"Most of the microgravity materials experiments to date have been processed at temperatures below 1200 degrees Centigrade. The new furnaces will be able to attain temperatures of up to 1600 degrees Centigrade or higher. With that higher temperature

-more-

capability, we will be able to accommodate a much larger number of experiment samples and process them at temperatures previously unobtainable in space," he said.

"Thus with the increased capacity and capability of these new furnaces, we will be able to learn much more about solidification of metals and semiconductor materials and their applications on a given mission," said Chassay.

The Space Shuttle is designed to accommodate scientists and their instruments in low-earth orbit. In this space laboratory, scientists can perform experiments that are impossible or impractical on Earth.

NASA News

National Aeronautics and
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For Release

July 15, 1987

RELEASE NO: 87-90

NOTE TO EDITORS/NEWS DIRECTORS

A media briefing on the status of NASA's Space Shuttle Solid Rocket Motor redesign effort will be conducted at 2:00 p.m. CDT, Thursday, July 16, by John Thomas, manager of the Solid Rocket Motor Design Team at the Marshall Space Flight Center, in Huntsville, Ala. The briefing will include results from the May 27 Engineering Test Motor (ETM-1) firing in Utah, which was the first in a series of full scale motor tests associated with the redesign effort.

The briefing will originate from the Marshall Space Flight Center Communications Building 4207, and will be carried live on NASA Select TV with two-way question and answer capability available at NASA Headquarters and other participating NASA centers.

NASA News

National Aeronautics and
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For Release
July 15, 1987

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Hugh Harris
Kennedy Space Center, Fla.
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RELEASE: 87-91

BOARD NAMED TO INVESTIGATE ATLAS CENTAUR 68 VEHICLE MISHAP

NASA today announced the formation of a board to investigate the July 13 vehicle handling mishap which resulted in extensive damage to the Centaur stage of the Atlas Centaur 68 (AC-68) launch vehicle. The team will investigate the accident and report its findings and recommendations by Aug. 14, 1987, to RADM Richard H. Truly, Associate Administrator for Space Flight, who will forward the report to the NASA Administrator.

Chairman of the board is James B. Odom, Director, Science and Engineering Directorate, Marshall Space Flight Center, Huntsville, Ala.

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Other members of the board are: Charles D. Gay (Deputy Chairman), Director, Shuttle Operations Directorate, Kennedy Space Center, Fla.; Maj. John T. Brock, USAF, Test Director, DOD Shuttle Payloads, 6555th Aerospace Test Group (ASTG/SMSP), Cape Canaveral Air Force Station, Fla.; William C. Higgins, Safety Operations Branch, Health, Safety and Security Division, Lewis Research Center, Cleveland; and Albert A. Yetman, Head, Cryogenics, Propulsion and Fluid Systems Branch, Engineering Directorate, Goddard Space Flight Center, Greenbelt, Md.

Affiliates to the board are: Executive Secretary - James E. Weir, Chief, Payload Support Office, Payload Management and Operations Directorate, KSC; Legal Counsel - Douglas G. Hendriksen, Procurement Counsel Staff, KSC; Public Affairs - Hugh W. Harris, Deputy Director, Public Affairs, KSC; Office of Safety, Reliability, Maintainability and Quality Assurance - Charles W. Mertz, Manager, Systems Safety, Safety Division, NASA Headquarters, Washington, D.C.; KSC Safety Office - John J. Wortman, Fire and Industrial Branch, Safety, R&QA and Protective Services Directorate, KSC; and Office of Space Flight - William H. Hamby, Director, Safety, Reliability and Quality Assurance (OSF), NASA Headquarters.

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The accident occurred at 11 a.m. EDT at Atlas Centaur launch complex 36, Cape Canaveral Air Force Station, Fla., where the vehicle was undergoing processing for the launch of the FLTSATCOM F-8 communications satellite. While removing a service platform in preparation for lifting the Centaur stage to troubleshoot a liquid oxygen leak, a workstand contacted the surface of the stage and caused a rupture of the Centaur's hydrogen tank.

NASA News

National Aeronautics and
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For Release

July 28, 1987

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Jim Ball
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RELEASE: 87-95

NASA SELECTS NEW CENTERS FOR COMMERCIAL DEVELOPMENT OF SPACE

NASA today announced the selection of seven new teams to conduct pioneering research into areas promising to the commercial development of space.

The industry/university teams are eligible to receive up to \$1 million annually for the next 5 years to support research which could lead to new technologies commercially exploitable in space.

This year's selection of new Centers for the Commercial Development of Space (CCDS) includes the first to specialize in the disciplines of space propulsion, space power, life sciences and materials for space structures.

The new centers are:

- * The University of Tennessee Space Institute - Center for Advanced Space Propulsion, Tullahoma, Tenn.

- * Auburn University - Center for the Commercial Development of Space Power, Auburn, Ala.

- * Environmental Research Institute of Michigan - Center for the Commercial Development of Autonomous and Man-Controlled Robotic Sensing Systems in Space, Ann Arbor, Mich.

- * Pennsylvania State University - Center for Secretion Research, University Park, Penn.

- * University of Colorado - Center for Bioserve Space Technologies, Boulder, Colo.

- * Case Western Reserve University - Center on Materials for Space Structures, Cleveland, Ohio.

- * Texas A&M Research Foundation - Center for Commercial Development of Space Power, College Station, Texas.

The seven new centers were selected from 28 proposals submitted in April to NASA in response to the agency's third round of CCDS solicitations. Nine commercial development centers already are in operation with NASA funding support following their selection in 1985 and 1986.

"The return on this research investment already is becoming evident through advances such as the recent breakthrough in superconductivity," said NASA Assistant Administrator for Commercial Programs Isaac Gillam IV.

Recent discoveries by two CCDS researchers, Dr. C. W. Chu of the University of Houston and Dr. M. K. Wu of the University of Alabama in Huntsville, offer the potential for broad applications in space, notably improved, more efficient spacecraft electrical systems.

NASA funding of the Centers for the Commercial Development of Space is a grant program to provide "seed money" in support of research and development related to the space environment.

NASA FactSheet

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

CENTERS FOR THE COMMERCIAL DEVELOPMENT OF SPACE (Fact Sheet)

A key element in NASA's initiative to support the expanded commercial use of space is the creation of innovative research institutions funded through a cooperative partnership of industry, universities and government.

Known as the Centers for the Commercial Development of Space (CCDS), these non-profit research organizations focus on specific technology areas identified as having potential for future commercial development in space.

NASA's Office of Commercial Programs manages the grant program and provides funding up to \$1 million annually to the commercial development centers, which also receive support from corporate and university affiliates.

NASA support represents "seed money" to establish and sustain the centers while increasing non-NASA financial and institutional contributions lead to self sufficiency for the CCDSs after a period of 5 years.

The space agency also offers to the CCDS NASA scientific and technical expertise, opportunities for cooperative activities and other forms of continuing assistance.

The CCDS program began in late 1985. In the first two solicitations, nine centers were selected by NASA to conduct pioneering commercial development research in areas ranging from materials processing to remote sensing. These centers represent involvement by 58 private companies, 22 universities and 6 other government agencies.

Seven CCDS have been added to the program as a result of the 1987 solicitation. These include the first centers to specialize in the areas of space power, space propulsion, life sciences and materials for space structures.

In soliciting proposals for the CCDS grant program, NASA identifies a number of research areas considered to have promising commercial potential.

Proposals submitted to NASA are evaluated by a distinguished independent group of peer reviewers representing industry, academia and government.

The selections are based on these evaluations and the availability of budgeted funds for this activity. Continued funding of a CCDS depends on the center receiving a favorable

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annual review of its progress.

Though NASA designates the general area of commercial development research for each center, the specific agenda of research and development activities are determined by the private sector to produce benefits for commercial enterprises.

The 16 CCDS, their host facility and the year of their selection are:

1985

- Center for Advanced Materials, Battelle Columbus Laboratories, Columbus, Ohio.
- Center for Macromolecular Crystallography, University of Alabama - Birmingham.
- Consortium for Materials Development in Space, University of Alabama - Huntsville.
- ITD Space Remote Sensing Center, NASA National Space Technology Laboratories, Mississippi.
- Center for Space Processing of Engineering Materials, Vanderbilt University, Nashville, Tenn.

1986

- Center for Development of Commercial Crystal Growth in Space, Center for Advanced Materials Processing, Clarkson University, Potsdam, N.Y.
- Center for Space Vacuum Epitaxy, University of Houston, Texas.
- Center for Mapping, Ohio State University, Columbus.
- Center for Space Automation & Robotics, University of Wisconsin, Madison.

1987

- Center for Advanced Space Propulsion, University of Tennessee Space Institute, Tullahoma.
- Center for the Commercial Development of Space Power, Auburn University, Auburn, Ala.
- Center for the Commercial Development of Autonomous and Man-Controlled Robotic Sensing Systems in Space, Environmental Research Institute of Michigan, Ann Arbor.
- Center for Secretion Research, Pennsylvania State University, University Park.
- Center for Bioserve Space Technologies, University of Colorado, Boulder.
- Center on Materials for Space Structures, Case Western Reserve University, Cleveland, Ohio.
- Center for Commercial Development of Space Power, Texas A&M Research Foundation, College Station, Texas.

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NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:
August 5, 1987

Dom Amatore
Marshall Space Flight Center
Huntsville, Ala.
(Phone: 205-544-0034)

Barbara E. Selby
Headquarters, Washington, D.C.
(Phone: 202-453-8536)

RELEASE: 87-119

NASA INITIATES HEAVY LIFT LAUNCH VEHICLE STUDY

NASA said today it would initiate a study of a heavy lift launch vehicle that could use the engines, solid rocket boosters, external fuel tank and launch facilities of the present Space Shuttle. The Shuttle orbiter could be replaced by an unmanned cargo element.

The chief purpose of the study, the agency said, is to determine whether the vehicle -- tentatively known as Shuttle-C (for cargo) -- would be cost effective in assembling and operating the Space Station.

The results of the study will be considered part of the

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studies already underway of a heavy lift launch vehicle. This vehicle, known as the Advanced Launch System (ALS), is being jointly studied by the Air Force and NASA. Elements of the modular ALS also will be considered as alternatives for aiding Space Station assembly and/or operations. A joint DOD/NASA steering group will monitor the progress of the studies.

The NASA-led Shuttle-C study will include Air Force participation and concentrate on minimum modification of existing systems and facilities. The Air Force-led ALS study, which includes NASA participation, concentrates on systems incorporating advanced technologies. The results of the Shuttle-C efforts will be integrated with the other ALS studies and enable the steering group to formulate national heavy lift vehicle strategy that may best accommodate both near term requirements, such as Space Station assembly and longer term objectives for reduced space transportation costs.

The agency said the Shuttle-C study will focus on the early heavy lift capability making maximum use of existing Shuttle systems to minimize vehicle development cost and schedule risk and to assure payload compatibility with the existing Space Shuttle payload environment.

If cost effective, such a vehicle could be used to launch planetary missions and serve as an unmanned test bed for new Shuttle boosters. The Shuttle-C would be able to lift 100,000-150,000 pounds into orbit.

The availability of such a vehicle for Space Station

-more-

assembly would free the Space Shuttle for increased work in all the sciences -- solar system exploration, astronomy, life sciences and materials processing experimentation. Progress in all these areas was severely constrained by the Challenger accident, and there is a pressing need for the nation to catch up, according to numerous studies.

NASA said it would seek answers to the following questions in its Shuttle-C study:

- o With the exception of the orbiter, can the other major hardware elements of the Space Shuttle be used?

- o Can present Shuttle ground facilities be used without change?

- o Can the Space Station be effectively and safely launched on the Shuttle-C? This will require a detailed analysis of cargo carrier loads in relation to other elements of the system.

- o Can such a "minimum change" program produce a highly reliable heavy lift capability by mid-1993 so it would be useful for Space Station assembly?

- o What role would Shuttle-C have in the National Space Transportation architecture through the end of the century?

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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August 7, 1987

RELEASE NO: 87-99

MARSHALL CENTER AWARDS CONTRACTS FOR ADVANCED SOLID ROCKET MOTOR STUDIES

NASA's Marshall Space Flight Center in Huntsville, Ala., today awarded contracts to five aerospace firms for design and definition studies for an Advanced Solid Rocket Motor for the Space Shuttle.

The nine-month long contracts, not to exceed \$3.3 million each, were awarded to Aerojet Solid Propulsion Company of Sacramento, Calif.; Atlantic Research Corporation of Alexandria, Va.; Hercules Aerospace Company's Aerospace Division of Salt Lake City, Utah; Morton Thiokol, Inc., of Brigham City, Utah; and United Technologies Chemical System Division of San Jose, Calif.

These same firms performed conceptual studies of alternative solid rocket motor designs from September to December 1986.

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Under today's contracts, the five companies will develop preliminary Advanced Solid Rocket Motor designs with supporting design analyses, conduct detail design assessments to increase solid rocket motor reliability and performance, and evaluate incremental advanced motor changes that would permit Space Shuttle performance increases up to 12,000 pounds of payload.

The preliminary designs will include both a segmented motor design, like the current Shuttle motors, and a monolithic motor design, wherein the full-length motor case is assembled and the propellant is cast without joints.

Based on the results of the nine-month studies, a decision will be made whether to pursue the design, development, test and production for an advanced motor beginning in fiscal year 1989. A decision to proceed would allow the advanced motor to be available for Shuttle flights in late 1993.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release:

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August 5, 1987

RELEASE NO: 87-100

SPACE STATION LABORATORY MODULE NEW ATTRACTION ON MARSHALL SPACE FLIGHT CENTER TOUR

Tourists who visit NASA's Marshall Space Flight Center in Huntsville, Ala., will see something new -- a brightly lit and highly detailed mockup of a Space Station U.S. laboratory module.

Although actual construction of the Station and its placement in orbit are a number of years away, visitors to the Marshall Center now have a chance to view first-hand what major elements of the Station may look like. Visitors are permitted to look inside the module from a platform at one end. The U.S. laboratory mockup represents one of several laboratories that will actually be placed in orbit by the Space Shuttle.

Once in orbit, the U.S. Laboratory will be the site where important research and development work will be accomplished to understand and characterize the effects of near zero gravity on man and materials. Experiments on the STS/Spacelab have shown

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that new hi-tech materials with vastly enhanced properties can be made in the low gravity environment of space. Application R&D in the U.S. Lab will build on this knowledge to produce electronics, pharmaceuticals, and alloys not possible to make on earth. The knowledge gained from Life Sciences experiments in the U.S. Lab into the effects of low gravity on human beings for substantial periods is essential in planning manned missions to the planets.

In addition to the modules which the United States will provide, Japan and the European Space Agency also plan to provide one laboratory each.

By boarding a touring bus at the nearby Alabama Space and Rocket Center, a state-supported space-theme museum, visitors may observe the Space Station mockup facility as one of a number of tour stops along a 90-minute route through the Marshall Center.

Located in a hangar-like facility at the Marshall Center, the new full-scale model joins an already extensive complex of Space Station mockups, including a habitability module with crew quarters, waste management, medical facilities, an eating/meeting area, and a logistics module which will store "replenishables," such as food, clothing and oxygen.

Other viewing at the Space Station stop includes a finely detailed six-foot model of the entire Station and a full-sized representation of an unmanned telerobotic "space tug" that would move objects about in orbit.

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All the mockups will serve as a training ground for astronauts, scientists and engineers who will work aboard the Space Station the U.S. plans to orbit by 1996. At the present time -- and for some years to come -- the mockups primarily serve as engineering aids for concept and definition planning.

"We're very pleased with the fine workmanship of the laboratory module," said Alberta Quinn, an engineer who oversees the mockup area. "Fidelity of the test chambers and other lab equipment is very high. Of course, we won't know the final design of any of the Space Station elements until its design and development has been completed. That won't be until the early 1990s."

As the years progress, the mockups will evolve to become closer to the actual design of the Station. Once the fidelity of the ground-based elements matches the Station in orbit, the mockups will begin to fulfill their destiny -- as the training center for future Space Station workers.

"And the tourists who visit here will have a chance to watch this growth and evolution of the mockups," said Quinn. "It'll be an exciting time for all of us."

The Marshall Center has roughly 40 percent of the entire NASA-wide effort to build the Space Station. Among other assignments, it has responsibility for construction of all U.S. modules -- the crew quarters, U.S. laboratory and logistics module -- the interconnecting passageways and the life support system.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release:

Jim Sahli
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August 5, 1987

RELEASE NO: 87-101

Note to City Editors/Assignment Editors

Media representatives are invited to Jan Dozier Day activities at Marshall Space Flight Center in Huntsville August 7 from 2-4 p.m. in building 4752. Huntsville Mayor Joe Davis has signed a proclamation declaring August 7 Jan Dozier Day in Huntsville.

Media representatives will have an opportunity to speak to Dozier at 1:30 p.m., prior to the start of the event at the same location. Media should report to the Public Affairs Office by 1:15 p.m.

Dozier, an aerospace engineer in Marshall's Science and Engineering Directorate, was recently selected by NASA as one of 15 new astronaut candidates, the first ever from Marshall Center. She will report to the Johnson Space Center on August 17 to start her astronaut training.

The program for the event will include presentations and

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reflections on Dozier's years at Marshall. Center Director J. R. Thompson will emcee the event. In addition, Dozier will meet with fellow employees as part of the activities. On hand to provide music will be the Huntsville High School Jazz Band.

The Huntsville-Madison County Chamber of Commerce also will host a community-wide celebration in honor of Dozier. That event will take place from 6-8 p.m. at the Alabama Space and Rocket Center on August 7. For more details about this event, contact the Chamber of Commerce.

If you need more information about the Marshall event, contact the Public Affairs Office at 205-544-0034.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release

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August 10, 1987

RELEASE NO: 87-102

MARSHALL SPACE FLIGHT CENTER PLANS SPACE STATION PROCUREMENTS

NASA's Marshall Space Flight Center in Huntsville, Ala., anticipates issuing requests for proposals for a dozen Space Station related competitive procurement actions within the next few months.

Marshall Center is responsible for one of four NASA Space Station work packages called Work Package One. It consists of the Space Station's U.S.-provided modules, which include the living quarters, one of the laboratories and a logistics module; the environmental control and life support system, the interconnecting node structure between the modules; and the internal thermal and internal audio-video systems.

The planned procurements include:

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CONTAMINANT GAS MONITOR--This procurement will be a two-phase 24-month program to provide a Contaminant Gas Monitor consisting of all sensors and analyzers required to identify and quantitatively measure the contaminants to the required sensitivity levels. These would be consolidated in a unified system interfacing with on-board computers and data system to provide a near-real-time analysis. Phase I will be to design, build, and test a demonstration model; Phase II will be to develop and fabricate a prototype Contaminant Gas Monitor. A potential follow-on effort would result in qualification and delivery of flight hardware.

INTERFACE EVALUATION TECHNIQUES DEVELOPMENT--This procurement covers a 12-month Phase I activity with options II and III which may be recompeted. The Phase I activity will define and document specific requirements as derived from an analysis of the Work Package One design, development, and operations responsibilities regarding verification. This analysis will utilize data developed by the prime contractor, NASA, and the international partners to compile information regarding the optimum approach to verification of integrated systems. The analysis will result in a plan for accomplishing verification.

ANALYTICAL INTEGRATION SYSTEMS DEVELOPMENT--This is a 12-month Phase I activity with a government option to pursue Phases II and III. The objective of Phase I is to define a baseline Space Station analytical integration concept and the associated hardware and software requirements for this system. The concept will include the capability to permit the function to

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be centralized and distributed and be performed by engineers who are not experts on the systems. The concept will evaluate Spacelab analytical integration processes and Advanced Development Program analysis tools in the development of a systems development plan consistent with overall Space Station operations and technical and management information support philosophies.

FINITE ELEMENT LOADS ANALYSIS AND TESTING--The period of performance for this procurement will be one year with the possibility of extensions to cover additional phases. This activity will develop one or more finite element structural models (stress and dynamic) of Work Package One elements formulated in both NASTRAN and SPAR. Studies will be conducted of the modal characteristics of free-free, fixed base, and trunion mass-loaded elements. Test requirements will be developed which will support static and dynamic testing of the elements with math model verification.

DEVELOPMENT OF THE DISTRIBUTED MODULE EXPERT SYSTEM--This is a 6-month activity to develop an increased fidelity expert system from the existing expert system in the Marshall Space Flight Center distributed Artificial Intelligence (AI) lab. The expert system will be developed in a modular fashion to allow different configurations with central or distributed data base and various requirements for data base. A simulator for data transfer over a network will be created with critical parameters adjustable from a menu. Deliverable test bed software will be on at least two VAX computers using Ethernet and Decnet for communications.

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DESIGN METHODOLOGY FOR MICROBIAL LOAD MONITORING--A

three-year feasibility effort involving (1) the development of a predictive model and the design of scientific experiments to support or disapprove hypotheses about the ecological behavior of microorganisms in a closed system, and (2) the development of technical equipment which facilitate the rapid monitoring of identified microorganisms. The contractor shall research at least two potential rapid monitoring methods and shall have an established laboratory facility.

ECLSS/ITCS DESIGN AND INTEGRATION--In support of the design validation and integration of the Environmental Control and Life Support System (ECLSS), Internal Thermal Control System (ITCS), and the Process Materials Management System (PMMS), this 7-year effort will require an assessment and plan with regard to the needs in the following areas: Systems Engineering and Integration, Phase C/D Prime Contractor Design Validation, Payload Accommodation and Integration Analyses, Process Materials Management System Design Validation, and Test Activities Analytical support.

SIMULATORS FOR ECLSS/SYSTEMS and HAZARDOUS SUBSTANCE TESTING--This 5-year activity will result in equipment and services to provide MSFC with a capability for systems integration and payload hazardous substance test operations independent of the Phase C/D contractor. The simulation will initially emphasize ECLSS and ITCS disciplines but will later be expanded to include DMS, power, communications, control and other module elements. A PMMS breadboard utilizing an existing

-more-

temperature altitude chamber at the same site will be addressed separately. NASA will perform all system testing and provide basic facility services.

The contractor will be required to provide all simulations and special service activities, including design, documentation, integration of the simulators into the facility, validation of simulation as well as safety/hazards evaluations.

SIMULATOR COMPUTER SYSTEM FOR SPACE STATION TRAINING FACILITY--This 18-month study will define the Simulation Computer System (SCS) which is to be the computational portion of the Marshall Space Flight Center Training Facility (MTF) for the Space Station project. The MTF will provide integrated Space Station Payload Training to payload flight crews, ground support operations personnel, and the user/science community. The SCS will host various levels of simulators of Space Station systems and experiments.

REMOTE MANIPULATOR SYSTEM--This 9-month contract includes six months for design of a neutral buoyancy simulator underwater Remote Manipulator System to simulate both the Shuttle RMS and Space Station MRMS (mobile RMS) and three months for design support after design completion. The new RMS design will incorporate the lessons learned from the current RMS and use the flight RMS design as a reference for joint position and configuration, physical dimensions, and operating modes.

REMOTELY CONTROLLED FLUID TRANSFER SYSTEM--This 20-month effort will result in the definition, fabrication, and assembly of a remotely controlled fluid/gas transfer system. An existing

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remotely controlled manipulator arm will be used to mate/demate the couplings as part of the system to demonstrate and evaluate fluid transfer.

INTRAVEHICULAR ACTIVITIES (IVA) ROBOT--This 24-month, two-phased task will be to study, evaluate, and demonstrate an engineering model robotic system for use in one or more of the Work Package One pressurized elements of the Space Station. The first phase will be to study and define the requirements and potential uses for IVA robotic systems. The second phase will be to perform simulations of the IVA robotic system which are sufficient to clearly demonstrate which concept best meets the Space Station IVA requirements.

NASA News

National Aeronautics and
Space Administration

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For Release:

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August 12, 1987

RELEASE NO: 87-103

FIRST REDESIGNED SHUTTLE ROCKET MOTOR SCHEDULED TO BE TEST FIRED AUGUST 27

Morton Thiokol's Space Division will test fire the first in a series of redesigned Space Shuttle solid rocket motors at 2 p.m. CDT Aug. 27 at its Wasatch Facility near Brigham City, Utah.

The test is part of the Shuttle motor redesign program. Morton Thiokol is NASA's prime contractor for the motor, and the Marshall Space Flight Center in Huntsville, Ala., manages the motor program for NASA.

The 126-foot long, 1.2-million pound Development Motor 8 (DM-8) will undergo a full-duration horizontal test firing of two minutes. The test is designed to evaluate the performance of major design features of the redesigned solid rocket motor, including the capture feature field joint, bonded field joint insulation, joint heaters and radially-bolted case-to-nozzle joint design.

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DM-8 includes three field joints with the capture feature and third O-ring, as well as a "J-seal" bonded internal insulation configuration. All three field joints and the case-to-nozzle joint will contain Viton (TM) O-rings. The field joints will also be equipped with a wrap-around electrical joint heater. In addition, several improvements in nozzle construction and assembly will be tested.

This will be the first full-size, full-duration test firing of a motor with the redesign features. The motor is fitted with 520 instruments to measure such things as acceleration, pressure, deflection, thrust, strain, temperature and electrical properties.

DM-8 FACT SHEET

Description

The DM-8 motor consists of eleven major steel case sections preassembled into four major casting segments. Each of the forward three segments includes a case section with the new capture feature tang at the aft end of the segment. The tang mates with a slightly modified but original configuration clevis at the forward end of the next segment, forming a field joint. The aft end of the aft segment contains a steel case section (aft dome) with the redesigned radial bolt case-to-nozzle factory joint.

All three field joints incorporate an electrical joint heater. The heaters are designed to keep the O-ring area of the field joints at a minimum of 75 degrees F.

DM-8 Configuration

DM-8 is a full-size Space Shuttle solid rocket motor, approximately 126 feet in length and 12 feet in diameter. The motor weighs 1,254,005 pounds, including 1,108,287 pounds of propellant.

The three field joints which connect the four casting segments are of the redesigned capture feature tang and clevis design with three Viton (TM) O-rings. The mating insulation

surfaces at each field joint are bonded with an adhesive, and include a prototype J-shaped deflection relief slot to reduce stresses and increase the sealing action of the bonded surfaces under motor pressure.

Flight configuration joint heaters are mounted around the motor case at each field joint location. Each heater contains two independent electrical power circuits thermostatically controlled to maintain joint temperatures at a minimum of 75 degrees F. An extensively instrumented external tank attach ring will be mounted on the case just aft of the aft field joint. Prototype heaters and an instrumented external tank attach ring were successfully tested on the ETM-1A motor on May 27.

The motor case-to-nozzle joint will be of the redesigned configuration with 100 radial bolts added. The 7/8-inch diameter radial bolts with Viton Stat-O-Seals (TM) are added to minimize the amount of joint opening during motor pressurization. The joint also incorporates adhesively bonded insulation surfaces, a shaped relief slot and an added Viton "wiper" O-ring designed to keep the adhesive on the insulation surfaces during assembly.

The exhaust nozzle incorporates added leak test ports; new ply angles in the nose ring, aft inlet ring and throat; and a throat inlet assembly with revised contour.

Being tested again on DM-8 are ply-angle changes in several parts of the exhaust nozzle. Ply-angle refers to the angle at which composite tape is wound onto a shaped mandrel during nozzle manufacture. Changed ply-angles have been shown in previous firings, including ETM-1A, to provide better control of nozzle

material erosion during firing. Another feature being evaluated is a backfill technique for applying sealant into the nozzle exit cone attachment joint and the forward exit cone to throat inlet joint. The nozzle also has added leak test ports to help verify factory joints within the nozzle.

A standard aft skirt containing thrust vector control equipment is fitted to the motor.

The DM-8 motor is fitted with 520 instruments to measure acceleration, pressure, deflection, thrust, strain, temperature, electrical properties and other conditions.

A depiction of DM-8 motor joint configurations is attached.

DM-8 Test Objectives

The eight primary test objectives for DM-8 are to evaluate:

Performance of the capture feature field joint design.

Performance of the bonded prototype J-seal insulation design.

Performance of radially bolted case-to-nozzle joint hardware.

Performance of unvented case-to-nozzle joint insulation.

Performance of the redesigned nozzle components.

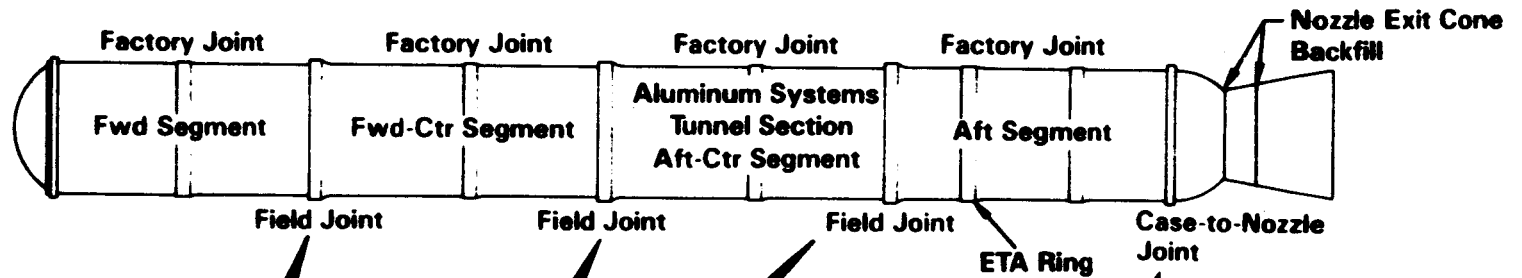
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RTV backfill of nozzle aft exit cone field joint and
nozzle throat to forward exit cone joint.

Aluminum systems tunnel bondline integrity.

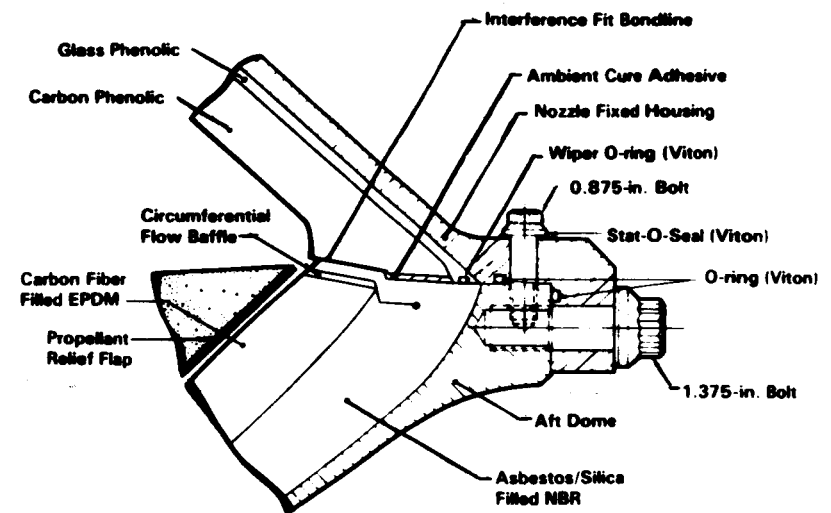
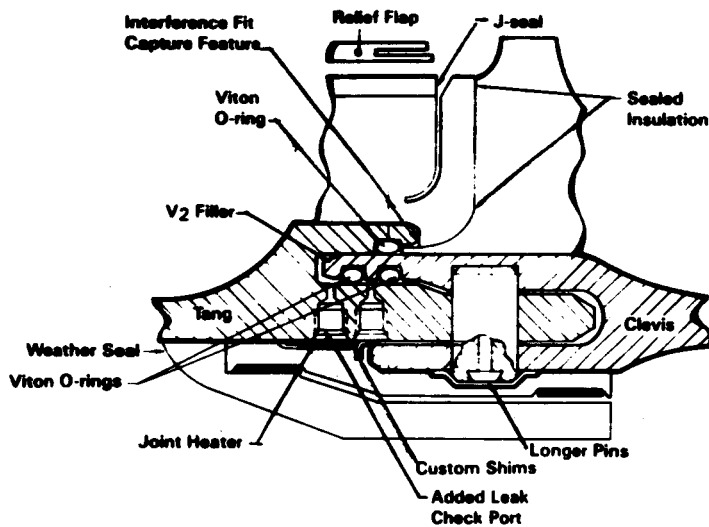
Structural integrity of external tank attach ring under
motor pressurization loads.

DM-8 Configuration



- Capture feature case
- Bonded J-seal
- Pressure-sensitive adhesive
- Viton primary seal
- Viton secondary seal
- Joint heater (75°F min)/weather seal
- V-2 filler

- Radial bolt attach
- Bonded configuration
- Viton primary seal
- Viton secondary seal
- Temperature control to 75°F min



NASA News

National Aeronautics and
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August 18, 1987

RELEASE NO: 87-103

NOTE TO EDITORS/NEWS DIRECTORS

The first full-duration test firing of NASA's redesigned Space Shuttle solid rocket motor is scheduled for Aug. 27 at Morton Thiokol's Wasatch Operations in Utah. In addition to the attached news release and fact sheet on this test, designated DM-8, other services will be available to assist the news media with coverage of test activities. These include a pre-test briefing (11 a.m. to noon MDT), the actual motor test firing (1 p.m. MDT), and a post-test briefing (2 to 3 p.m. MDT).

Television coverage of the briefings, test countdown and test firing itself will all be provided live on NASA Select Television (carried on RCA Satcom F2R, transponder 13, located at 72 degrees west longitude). There will be a two-way question and answer capability during both briefings

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for media representatives watching this television from NASA Headquarters, Marshall Space Flight Center, Kennedy Space Center, and Johnson Space Center. Videotape replays of the motor firing from several different cameras will be shown between the firing and the post-test briefing. Audio and video connections to receive NASA Select coverage will be available to media on-site at the NASA/Morton Thiokol DM-8 newscenter.

This joint NASA/Morton Thiokol newscenter will be in operation on test day only beginning at 8 a.m. MDT. The pre- and post-test briefings will originate from this newscenter. The newscenter is located at the Morton Thiokol test observation area, about 22 miles west of Brigham City, along Utah Highway 83. It consists of a five-trailer complex with workspace and telephones for media use. NASA and Morton Thiokol representatives will man a news desk in the newscenter (also only on test day). Telephone numbers for the news desk are 801-863-6880 through 6885.

For those media representatives planning to attend the test-day activities at Morton Thiokol, no advance accreditation is required. However, a courtesy call to the Morton Thiokol Public Relations Office, 801-863-3955, is requested to confirm the number of reporters and crew members attending. Current media credentials will be required to gain access to the newscenter and test observation site.

Due to the large number of media representatives expected for the DM-8 test, Morton Thiokol has indicated that

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it will not be able to conduct media tours of the plant site until several days after the test. Media requests for tours should be addressed to Rocky Raab in the Morton Thiokol Public Relations Office, 801-863-3955.

For additional information concerning DM-8 media activities, contact Rocky Raab at number above, or Ed Medal at the NASA Marshall Space Flight Center in Huntsville, Ala., 205-544-0034.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release

August 14, 1987

Jim Sahli
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RELEASE NO:87-105

PATHFINDER STACKED IN TPTA FACILITY

The forward segment of NASA's Pathfinder Test Article is lifted into place in the Transient Pressure Test Article (TPTA) facility at the Marshall Space Flight Center in Huntsville, Ala. The Pathfinder is an inert solid rocket motor test article which is being used to verify that all the interfaces are proper for the test stand to accept the first operational test article. That article will be delivered to the Center in early October. It will also be used to check out the hydraulic system that applies loads to the test article in the same way they will be applied in the flight article.

The TPTA tests, which are scheduled to start the first week of November, are being conducted to verify the new solid rocket motor field and nozzle-to-case joints. The tests will use the

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full-scale segments of the redesigned solid rocket motor.

The series of transient pressure tests, in conjunction with
Joint Environment Simulator tests and full-scale motor firings
being conducted at Morton Thiokol's Wasatch facility in Utah, are
expected to lead to qualification of the redesigned motor.

NASA plans four TPTA tests at the facility prior to launch of
Discovery in June 1988. (NASA photo by H. Johnson)

NASA News

National Aeronautics and
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For Release

Aug. 17, 1987

RELEASE NO: 87-108

NOTE TO EDITORS/NEWS DIRECTORS:

NASA released today Dr. Sally K. Ride's report to the NASA administrator defining and evaluating potential U.S. space initiatives. The objectives of Ride's study were to energize discussion of NASA's long range goals and to examine the issue of restoring and retaining U.S. leadership in space activities.

The agency also released a letter of response to Dr. Ride by NASA Administrator Dr. James C. Fletcher, who initiated the study.

Copies of the report and of the administrator's letter are available at the Marshall Space Flight Center Public Affairs Office.

-30-

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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For Release

Mike Wright
Marshall Space Flight Center
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August 19, 1987

RELEASE NO: 87-109

GOETZ NAMED SHUTTLE MAIN ENGINE CHIEF ENGINEER AT MARSHALL SPACE FLIGHT CENTER

Otto K. Goetz has been named chief engineer for the Space Shuttle Main Engine Project at the Marshall Space Flight Center in Huntsville, Ala.

Goetz, whose appointment was effective Aug. 2, has served as deputy chief engineer for the Space Shuttle Main Engine Project since October 1986.

In his new position, he will be responsible for assuring the continued technical adequacy of the Space Shuttle, including in-house engineering. He will also be responsible for assuring that the Marshall Center's Science and Engineering Directorate's technical commitments to the project are met.

Goetz will remain formally assigned to the Office of the Associate Director for Propulsion Systems in the Science and Engineering Directorate. He will be functionally assigned to the Space Shuttle Main Engine Project in the Shuttle Projects Office.

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A native of Rastatt, Germany, Goetz earned a degree in mechanical engineering in 1957 from the University of Karlsruhe. He joined the Marshall Center in 1962 as a flight systems engineer in the former Test Division.

He later served as deputy chief of the Propulsion Division in the Structures and Propulsion Laboratory and as chief engineer for the Space Shuttle development engine.

Among other awards Goetz received the NASA medal for exceptional engineering.

Goetz now lives in Huntsville with his wife, Lone. They have two children, Sabine, 22, and Christian, 20.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release

Barbara E. Selby
Headquarters, Washington, D.C.
(Phone: 202/453-8536)

August 21, 1987
11:30 a.m. CDT

Dominic A. Amatore
Marshall Space Flight Center, Huntsville, Ala.
(Phone: 205/544-0034)

RELEASE 87-127

NASA ISSUES RFP FOR SHUTTLE-C STUDY CONTRACTS

NASA today issued a request for proposals inviting industry to compete for two-phase systems definition study contracts for Shuttle-C. Shuttle-C will use the propulsion elements of the current Space Shuttle with the orbiter being replaced by an STS cargo element.

Marshall Space Flight Center will have management responsibility for the Shuttle-C study effort.

Shuttle-C, with a minimum lift capability of 100,000 pounds to low-Earth orbit, would provide an additional payload capability to that of the Shuttle orbiter fleet,

(MORE)

maximizing effective use of the National Space Transportation System as well as other existing systems and available test and launch facilities. The most immediate value of the Shuttle-C would be for Space Station assembly and logistics. It would also be available for future science missions, especially future missions to the outer planets.

Proposals for the system definition studies are due at NASA's Marshall Space Flight Center, Huntsville, Ala., on Sept. 21, 1987. Based on the proposals received, it is planned to select two or more contractors to perform the systems studies, with fixed-price contracts expected to be awarded in November.

Funds available for Phase I of this two-phase effort are approximately \$3 million. Proposals will also include a priced option for Phase II which, if implemented, is estimated at approximately \$13 million total. Proceeding with Phase II will depend on availability of funding and national policy decisions related to overall heavy lift launch vehicle development.

A major purpose of the study is to determine whether the vehicle would be cost effective in assembling and operating the Space Station.

(MORE)

The Shuttle-C study will focus on the early heavy lift capability making maximum use of existing Shuttle systems to minimize vehicle development cost and schedule risk and to assure payload compatibility with the existing Space Shuttle payload environment.

If cost effective, Shuttle-C could be used to launch planetary missions and serve as an unmanned test bed for new Shuttle boosters. The availability of such a vehicle for Space Station would free the Space Shuttle for increased work in all the sciences -- solar system exploration, astronomy, life sciences and materials processing experimentation.

The Shuttle-C study seeks answers to the following questions:

- * With the exception of the orbiter, can the major hardware elements of the Space Shuttle be used?

- * Can present Shuttle ground facilities be used without change?

- * Can the Space Station be effectively and safely launched on the Shuttle-C? This will require a detailed

(MORE)

analysis of cargo carrier loads in relation to other elements of the system.

* Can such a "minimum change" program produce a highly reliable heavy lift capability by mid-1993 in order to be useful for Space Station assembly?

* What role would Shuttle-C have in the National Space Transportation plan through the end of the century?

The NASA-led Shuttle-C study will include Air Force participation and concentrate on minimum modification of existing systems and facilities. The Air Force-led Advanced Launch System (ALS) study, which includes NASA participation, concentrates on systems incorporating advanced technologies. The results of the Shuttle-C efforts will be integrated with the other ALS studies and enable a steering group, comprised of DOD and NASA senior managers, to formulate national heavy lift vehicle strategy that may best accommodate both near-term requirements, such as Space Station assembly, and longer-term objectives for reduced space transportation costs.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release

Dom Amatore
Jim Sahli
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Sept. 15, 1987

RELEASE NO: 87-110

NOTE TO EDITORS

News media representatives are invited to attend a day-long Space Station Laboratory Workshop to be held at Marshall Space Flight Center in Huntsville, Alabama on Friday, Oct. 2, 1987.

The workshop will feature briefings on the U.S. Laboratory Module and its potential use, and tours of full-scale engineering mock-ups of the U.S. Laboratory Module and the Habitation Module. More than 100 attendees will participate in the conference, including representatives of space agencies in Europe, Japan and Canada, NASA officials, U.S. astronauts, designers and potential users of the permanently manned Space Station.

This workshop is an excellent opportunity to learn first-hand how the Space Station living and working areas may look and how they will be used. For more information about the workshop, please see the attached news release.

-more-

Photography will be permitted during the workshop, and there will be an opportunity at midday for reporters to question representative workshop participants.

Those wishing to attend the workshop should contact Dominic Amatore or Jim Sahli of the Marshall Center Public Affairs Office at 205 544-0034 by September 25. The workshop begins at 8:00 a.m. and concludes at 5:00 p.m. There is no fee, and lunch will be available at a cost of \$5.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release

Bob Lessels
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Aug. 28, 1987

RELEASE NO: 87-112

SUBJECT: Shuttle-C Task Team Established at Marshall

James R. Thompson, director of NASA's Marshall Space Flight Center in Huntsville, Ala., has directed the establishment of a Shuttle-C Task Team, headed by Robert G. (Glenn) Eudy.

The team will work within the Marshall Center's Advanced Projects Office in the Program Development Directorate, to support the center's Heavy Lift Launch Vehicle Definition Office. The HLLV Definition Office is headed by Thomas J. Lee, deputy director of the MSFC.

Thompson charged the team with managing the extensive in-house and contracted study efforts under way to define a cargo vehicle (Shuttle-C) that will provide flexibility and high reliability for unmanned missions in support of the Space Station, planetary missions and other missions as appropriate.

(MORE)

In appointing Eudy to head the team, Thompson cited Eudy's experience in vehicle systems engineering, program management and space systems design.

On Aug. 21, NASA announced its decision to request proposals from industry to compete for two-phase systems definition study contracts for Shuttle-C. Shuttle-C is to use the propulsion elements of the current Space Shuttle with the orbiter being replaced by the unmanned cargo element.

In making the announcement, NASA gave the Marshall Space Flight Center management responsibility for the Shuttle-C study effort.

NASA News

National Aeronautics and
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September 2, 1987

RELEASE NO: 87-114

ACCEPTANCE TESTS BEGIN ON SHUTTLE MAIN ENGINES FOR STS-26 LAUNCH

Acceptance testing has begun on the first of three Space Shuttle main engines earmarked for use on the June 1988 launch of the next Shuttle mission, STS-26.

Testing is being done at NASA's National Space Technology Laboratories in Mississippi by the Rocketdyne Division of Rockwell International, NASA's prime contractor for the Shuttle engines. The Marshall Space Flight Center in Huntsville, Ala., manages the engine program for NASA.

The engines incorporate several improvements made as a result of an extensive and on-going test program. These changes include improvements to the electronic controller, valve actuators, temperature sensors, main combustion chamber, and various modifications to the turbopumps to improve life and operating margin.

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During acceptance testing, three hot-fire tests, totaling about 770 seconds, will be run on each of the STS-26 flight engines. The tests include a 1.5-second ignition test, 250-second calibration test and a 520-second nominal mission simulation test.

The 1.5-second test was successfully conducted Aug. 11 on the first engine, number 2027, and the other tests on that engine are scheduled to be completed in September. Following completion of testing on engine 2027, testing will begin on the second engine, number 2022, followed by the third engine, number 2019. Acceptance testing on all the flight engines is expected to be complete in December.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Sept. 15, 1987

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Bob Lessels
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RELEASE NO: 87-116

FIRMS SELECTED TO NEGOTIATE FOR LIQUID-FUELED ROCKET BOOSTER STUDY CONTRACTS

NASA's Marshall Space Flight Center at Huntsville, Ala., today selected two firms: General Dynamics of San Diego, Calif., and Martin-Marietta of New Orleans, La., to negotiate for conceptual design studies of liquid-fueled rocket boosters proposed for potential future use on the Space Shuttle and other, follow-on launch vehicles.

The two contracts, each valued at approximately \$2.5 million, will involve 9-month parallel studies of both pressure-fed and pump-fed liquid-fueled rocket boosters. Both contractors will develop a recommended design concept for each system.

The liquid rocket booster studies will evaluate various booster configurations and propellant combinations to establish potential designs.

(MORE)

The analyses will include rigorous assessments of performance, systems safety, reliability and integration of the LRB with the current Space Transportation System and existing launch facilities, recovery and reusability, and both operational and development costs.

Other areas to be assessed during these studies will include cost effectiveness of recoverable versus expendable systems, techniques for recovery of the liquid rocket boosters, and salt water exposure damage control.

The Marshall Center will serve as NASA's primary center in cooperation with three other NASA centers. The Johnson Space Center in Houston, Texas, will investigate the proposed boosters' interface with the overall Space Transportation System; the Kennedy Space Center, Fla., will evaluate the liquid rocket boosters' effects on existing launch and vehicle assembly facilities; and Langley Research Center, Hampton, Va., will support evaluation of aerodynamic and aerothermal dynamic data generated at the Marshall Center.

Results of the liquid rocket booster study should be available by next summer to support NASA management decisions regarding possible liquid rocket booster implementation as a replacement for the current solid propellant booster system. These study results also could aid in future agency decisions regarding the planning and configurations selected for advanced launch vehicles.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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For Release:

September 14, 1987

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RELEASE NO: 87-117

NASA RESPONDS TO REPORT BY NRC COMMITTEE ON SPACE STATION

NASA has reviewed the report by the National Research Council Committee on Space Station and agrees with most of the findings and recommendations. NASA is extremely pleased that upon reviewing alternative configurations for the Space Station, the Committee judged none to be as satisfactory as NASA's Block 1 baseline and recommended that it be adopted as the initial Space Station configuration.

This recommendation provides an important, independent validation of the Space Station design which has been thoroughly studied for over 3 years. It provides clear evidence to the Administration and Congress that the Space Station NASA is developing is of sound design and properly balances fiscal restraint and program scope.

However, NASA questions the Committee's findings regarding program risk and cost.

First, NASA does not agree that deployment of the Space Station with the current Space Transportation System (STS) will be "risky." This finding does not reflect the current state of Space Station planning. NASA has recently reexamined the

-more-

capabilities of the post-Challenger STS system and has developed a modified assembly sequence that decreases the weight of the first and second payloads and gives NASA a high degree of confidence that the Space Station can be successfully deployed with the current Shuttle system. These data, which delineated a modified assembly sequence, were recently presented to the NRC and may not have been fully evaluated to permit incorporation into the final NRC report.

Secondly, NASA believes the Committee's estimate that up to \$3.9 billion may be needed for back-up hardware and test program enhancements is much too high. NASA agrees that additional back-up hardware, such as large structural spares used in the event such hardware is lost during manufacture, launch or assembly, may be needed. This contingency hardware would cost approximately \$200 million. However, NASA's development cost estimate for the Space Station already includes a large amount of flight-type test hardware. NASA also has developed a cost-effective test program that it believes provides the proper balance of flight and flight-type hardware and simulators to perform preflight element and launch package checkout.

NASA has based the deployment and routine resupply of the Space Station on a four-orbiter fleet and remains confident that the current fleet is adequate to support the Space Station program. NASA's mixed fleet plan provides the flexibility to further augment the transportation system depending upon user requirements and the balance between the need for additional orbiters and expendable launch vehicles will be continually addressed in the future.

NASA agrees with, and has already incorporated in its planning, many of the NRC Committee's other recommendations. NASA is working with other elements of the Administration and the Congress to provide a long-range focus for the nation's space program.

The Space Station represents a bold new chapter in America's quest to explore and utilize the environs of space. It will serve as the point of departure for U.S. efforts to continue manned and unmanned exploration of the solar system. President Reagan recognized the practical as well as the symbolic virtues of such an enabling facility when he directed NASA to develop the Space Station in 1984. Congress has been supportive, providing both funds and guidance.

The NRC report points out that the Space Station represents a national commitment and NASA strongly endorses that theme. NASA believes the American people are committed to a bold and far-reaching program that will maintain the United States leadership position in the peaceful use of outer space. The Space Station represents an important step that will assure our future in space.

NASA News

National Aeronautics and
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For Release

September 15, 1987

Jack Riley
Johnson Space Center, Houston
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Release: 87-139

SPACE SHUTTLE MISSION STS-27 CREW NAMED

NASA today announced five crew members for STS-27, a Department of Defense Space Shuttle mission targeted for early fall, 1988, aboard the orbiter Atlantis.

Crew members are Robert L. Gibson (Cdr.,USN), commander; Guy S. Gardner (Lt.Col.,USAF), pilot; and mission specialists Richard M. Mullane (Col., USAF), Jerry L. Ross (Lt.Col., USAF) and William M. Shepherd, (Cdr., USN).

Gibson was pilot of STS-41B in February, 1984, and commander of STS-61C in January, 1986. He was born October 30, 1946, in Cooperstown, N.Y., but considers Lakewood, Calif., his hometown.

STS-27 will be Gardner's first space flight. He was born January 6, 1948 in Alta Vista, Va., but considers Alexandria,

-More-

January 6, 1948 in Alta Vista, Va., but considers Alexandria, Va., his hometown.

Mullane flew as a mission specialist on STS-41D in August, 1984. He was born September 10, 1945, in Wichita Falls, Tex., but calls Albuquerque, N.M., his hometown.

Ross was a mission specialist on STS-61 in November, 1985. He was born January 20, 1948, in Crown Point, Ind.

Shepherd will be making his first space flight. He was born July 26, 1949 in Oak Ridge, Tenn.

NASA News

National Aeronautics and
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For Release:
Sept. 24, 1987

RELEASE NO: 87P-119

SOLID ROCKET MOTOR TEST FACILITY COMPLETED AT MARSHALL;
TESTING BEGINS IN NOVEMBER

NASA's Marshall Space Flight Center in Huntsville, Ala., has completed construction of its Transient Pressure Test Facility which will be used for a series of Space Shuttle solid rocket motor tests scheduled to start in early November. The tests will verify the ignition pressure dynamics of the motor. These tests, in conjunction with Joint Environment Simulator tests and full-scale motor firings being conducted at Morton Thiokol's Wasatch Facility in Utah, are expected to lead to qualification of the redesigned motor. In this photo, to the left is the access tower where the test article will be fired. The large building in the center is the Refurbishment Facility where the test articles will be refurbished for subsequent tests.

(NASA photo by Dennis Keim)

-30-

NASA News

National Aeronautics and
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For Release:
Sept. 23, 1987

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RELEASE NO. 87-120

ROCKET MOTOR TEST FIRING LABELED 'COMPLETELY SUCCESSFUL'

"Completely successful." That's how John Thomas, manager of NASA's Solid Rocket Motor Design Team, has characterized the Aug. 30 first full-duration test firing of the redesigned Space Shuttle solid rocket motor.

Thomas held a televised press conference at the Marshall Space Flight Center in Huntsville, Ala. on Sept. 18 to report on the results of the data analysis, and disassembly and inspection of Development Motor 8 at Morton Thiokol's facility near Promontory, Utah.

"There were some 500 measurements on this test. We have got about 70 percent of those processed now in engineering units and plots. We have reviewed about 20 percent of the data and so far that data looks very good," Thomas said. He said a final report on DM-8 will be completed by the end of October.

-More-

He called DM-8 "a very close replica of the motor we intend to fly" on the next Shuttle flight in June 1988.

One of the primary objectives of last month's test, Thomas noted dealt with the performance of the three field joints on the 126-foot long, 1.2 million pound development motor which underwent a full-duration horizontal test firing for two minutes.

"We were looking to see if the insulation sealed as we predicted it would. We had predicted a five-thousandth {inch} gap opening and from the data we received it was on that order... We believe that based on this derived quick-look data that joint opening was six-thousandth rather than five-thousandth. A sheet of paper is on the order of three to four-thousandth," Thomas said.

The design team manager added that, "There was no evidence of any hot gas reaching any O-ring not even a capture feature O-ring. The insulation as we sealed it with the adhesive performed as we predicted."

Another major objective of the DM-8 test dealt with the performance of the case-to-nozzle joint. "Again we were concerned about gap opening," he explained. "We had predicted seven-thousandth of an inch and from the quick look data... it looks like we got 7 mils or very close thereto. We did not get any hot gas in the case-to-nozzle joint O-rings either and there was no evidence of any excessive erosion."

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Also as part of Friday's briefing Thomas said he was pleased with the performance of the wrap around electrical joint heaters used on the three field joints.

Thomas summarized the results of the test firing by saying, "We have fully met the test objectives."

He told the reporters that preparations are underway for the test firing of Development Motor 9 (DM-9) in late November. "The two aft segments are already loaded with propellant. The other two are insulated and lined and are about to begin the casting process.

"All of our activity is directed toward a June 1988 launch," Thomas said.

NASA News

National Aeronautics and
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For Release

Sept. 30, 1987

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RELEASE: 87-121

MARSHALL CENTER PAYLOADS ANNOUNCED FOR SHUTTLE DISCOVERY MISSION

NASA's Marshall Space Flight Center in Huntsville, Ala., is involved with seven of the 11 secondary payloads announced yesterday to fly aboard the next Space Shuttle mission.

The Marshall Center is responsible for development or mission management, or both, of six microgravity experiments, one of which is a life sciences type experiment, and an atmospheric science experiment slated for STS-26. The other four secondary payloads include another atmospheric experiment, an infrared communications experiment, and two student experiments.

-more-

The primary payload to be carried aboard the orbiter Discovery on the scheduled June 1988 flight is NASA's Tracking and Data Relay Satellite. The eleven secondary payloads which will be flown in Discovery's middeck area are:

- * Automatic Directional Solidification Furnace -- a technology demonstration of directional solidification of magnetic materials, immiscibles and infrared detection materials (sponsored by NASA's Office of Space Science and Applications [OSSA], development and mission management by Marshall Center.

- * Physical Vapor Transport of Organic Solids -- a materials research experiment of the 3M Corp., St. Paul, Minn., to grow crystalline films on selected substrates of organic solids (sponsored by NASA's Office of Commercial Programs [OCP], mission management by Marshall Center.

- * Infrared Communications Flight Experiment -- to demonstrate feasibility of using diffuse infrared light as a carrier for Shuttle crew communications (sponsored by NASA's Office of Space Flight [OSF].

- * Protein Crystal Growth -- utilizes the weightless environment of space flight to grow protein crystals of a size and quality needed to determine the molecular structure of the proteins. Such information is essential for understanding protein functions, synthesis and for drug design (co-sponsored by OCP and OSSA, development and mission management by Marshall Center.

- * Isoelectric Focussing Experiment -- an experiment to gather data on the extent of electro-osmosis in space (sponsored by OSSA, development and mission management by Marshall Center.

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* Handheld Microgravity Experiment -- a category of simple experiments to study low gravity effects on selected physical processes. This STS-26 experiment, called Phase Partitioning Experiment, will study the physics associated with the separation of two-phase polymer solutions (in this case, dextran and polyethylene glycol), which could lead to a better understanding of a method used in separating biological cells (sponsored by OSSA, development and mission management by Marshall Center).

* Aggregation of Red Blood Cells -- an experiment to study aggregation of red cells and blood viscosity under low-gravity conditions (sponsored by OSSA, mission management by Marshall Center).

* Mesoscale Lightning Experiment -- TV and photographic data will be collected to survey the lightning activity occurring simultaneously and separated by large distances. This data will be used to establish a better understanding of lightning and its relationship to severe weather development (sponsored by OSSA, concept development by Marshall Center).

* Earth-limb Radiance Experiment -- an experiment to obtain measurements of Earth-limb radiance for various positions of the Sun (sponsored by OSSA).

* Student Experiment -- designed by high school student Lloyd Bruce, St. Louis, Mo., and sponsored by McDonnell Douglas, the titanium grain crystal reorganization study will heat titanium metal filaments and observe the effect of weightlessness on its molecular structure (sponsored under NASA's Space Shuttle Student Involvement Program, Office of Educational Affairs).

* Student Experiment -- designed by S. Richard Cavoli, Marlboro, N.Y., and sponsored by Union College, Schenectady, N.Y., to study the control of crystal growth through the use of a semi-permeable membrane. Such crystals have application to development of image-intensifying screens for use to detect gamma and X-rays (sponsored under SSIP).

- end -

NASA News

National Aeronautics and
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For Release:

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Oct. 7, 1987

RELEASE NO: 87-122

CHAPPELL NAMED NEW ASSOCIATE DIRECTOR FOR SCIENCE AT MARSHALL

Marshall Space Flight Center Director J.R. Thompson has announced the appointment of Dr. Charles R. (Rick) Chappell as the Center's associate director for Science.

In this role, Chappell will serve as an advisor to Center management on all science programs and will be responsible for furthering the in-depth scientific proficiency of the Center.

He also will be responsible for maintaining a strong and continuous interaction with scientific personnel and operations throughout the agency, with NASA scientific boards, committees and study groups, and with leading scientists throughout the world.

Chappell graduated in 1961 from Sidney Lanier High School, Montgomery, Ala. He received a bachelor of arts in physics, Magna

-More-

Cum Laude, from Vanderbilt University (Tenn.) in 1965 and was elected to the Phi Beta Kappa and Phi Eta Sigma honorary societies.

Chappell earned a doctorate in space science from Rice University in Houston, Texas, in 1968.

He was employed at Lockheed Palo Alto Research Laboratory as a research and staff scientist specializing in investigations of the Earth's plasmasphere and magnetosphere and other planetary ionospheres.

He joined the Marshall Center in 1974 as a study scientist for the Atmospheric, Magnetospheric, and Plasma in Space Project and as Chief, Magnetospheric Physics Branch, Space Science Laboratory, Science and Engineering Directorate.

In 1980, he was promoted to chief of the Solar Terrestrial Physics Division in the Space Science Laboratory.

Chappell was the principal investigator responsible for the development of specialized instrumentation which was flown on several NASA spacecraft, and he has served on numerous NASA advisory committees, including a committee of the National Academy of Sciences.

He was mission scientist for the 1983 flight of Spacelab 1 with responsibility for the science management of the payload which consisted of over seventy investigations in five disciplines.

In December 1985, he was selected as alternate payload specialist for the Earth Observation Mission (EOM) mission which

-More-

is scheduled to fly in the early 1990's.

He has received numerous awards including the NASA Medal for Exceptional Scientific Achievement in 1981 and again in 1984. He is the author of more than 100 scientific publications and has presented research papers at over 40 conferences and symposia throughout the world including the Nobel Symposium on Magnetospheric Physics in Sweden in 1984. Chappell was the convenor of a special symposium on low-energy plasma at the 1986 international meeting of the Congress of Space Research in Australia.

The scientist lives in Huntsville with his wife, Barbara, and their son, Christopher. Chappel is the son of Dr. and Mrs. Gordon T. Chappell of Montgomery. He is the son-in-law of Col. and Mrs. James W. Harris III of Austin, Texas.

In announcing the appointment, Thompson said, "We are indeed fortunate to have a scientist of Dr. Chappell's qualifications and prominence to fill this important position."

NASA News

National Aeronautics and
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For Release

Ed Medal
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October 16, 1987

RELEASE NO: 87-125

NEW SHUTTLE MOTOR TEST STAND DEDICATED IN UTAH

NASA and Morton Thiokol officials dedicated a new Space Shuttle solid rocket motor test stand with a ribbon-cutting ceremony at Morton Thiokol's Wasatch Facility in Utah on Thursday, Oct. 15.

The new stand, constructed in only 11 months, will be used for static firings of the redesigned Shuttle solid rocket motor.

The stand is specially constructed to induce added forces on a firing motor to simulate stresses experienced during actual flight. It also provides the capability to heat or refrigerate the test motor before firing to simulate hot or cold pre-launch temperature conditions.

As the second large motor test stand at Morton Thiokol, the new facility will also allow motor test firings to be performed more frequently than was possible with the single stand previously available.

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The first firing on the new stand is scheduled for early 1988. Prior to that, the stand will undergo fit and function tests, instrumentation checkout and other preliminary tests.

The Oct. 15 dedication included remarks by Ed Garrison, president of Morton Thiokol's Aerospace Group, and J.R. Thompson, director of NASA's Marshall Space Flight Center in Huntsville, Ala.

Morton Thiokol is NASA's prime contractor for the Space Shuttle solid rocket motor, and the Marshall Center manages the motor program for NASA.

NASA News

National Aeronautics and
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For Release:

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Oct. 19, 1987

RELEASE NO: 87-155

SUBJECT: NASA PRESENTS EXCELLENCE AWARDS,
SEEKS NOMINEES FOR 1987 HONORS

NASA Deputy Administrator Dale Myers will formally present the space agency's Excellence Award for Quality and Productivity this week to divisions of IBM and Martin Marietta.

The agency also announced that it is receiving nominations for candidates to be considered for the 1987 excellence award. The deadline for initial applications is Nov. 1.

IBM Corporation's Federal Systems Division, located near NASA's Johnson Space Center, Houston, and Martin Marietta Manned Space Systems, at NASA's Michoud Assembly Facility, New Orleans, are the first recipients of the NASA excellence award.

(MORE)

Martin Marietta operates Michoud under contract to NASA's Marshall Space Flight Center at Huntsville, Ala. It is at Michoud that the giant external fuel tanks are made for use on the Space Shuttle.

Myers will travel to Houston on Wednesday and New Orleans on Thursday to officially present the awards to company managers and employees in ceremonies at their respective facilities. The selection of the two firms was announced earlier this year.

The NASA Excellence Award for Quality and Productivity is designed to recognize the highest standards of performance among NASA contractors, subcontractors and suppliers who are members of the aerospace industry.

To be eligible, a company must be a NASA prime contractor, subcontractor or supplier of hardware, software, or mission processing and service support; employ a minimum of 100 workers; and the candidate facility must be located in the United States.

In addition, the firm either must do half of its total business with NASA or conduct average yearly sales of at least \$500,000 with the agency. The program is administered for NASA by the American Society for Quality Control.

NASA News

National Aeronautics and
Space Administration

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For Release:

Oct. 20, 1987

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RELEASE NO: 87-126

NOTE TO EDITORS/NEWS DIRECTORS

NASA Administrator Dr. James C. Fletcher will visit the Marshall Space Flight Center in Huntsville, Ala., Monday, Oct. 26. While here, he will visit various center facilities and address Marshall employees.

Dr. Fletcher will be available to answer questions from the news media from 3:05 to 3:20 p.m. in building 4200.

Media desiring to participate in the question/answer session should be at the Public Affairs Office, building 4200, room 101, no later than 2:30 p.m. For additional information, contact the Public Affairs Office at (205) 544-0034.

NASA News

National Aeronautics and
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For Release

October 22, 1987

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Also released in
Washington, D.C.

RELEASE: 87-127

NASA ISSUES MIXED FLEET MANIFEST

NASA today issued a new, mixed fleet manifest reflecting primary payloads for Space Shuttle missions through 1990 and expendable launch vehicles (ELVs) through 1995.

The manifest reflects the high priority assigned to major science payloads. In 1989, five NASA science missions, some with international cooperation, will be launched. Four will fly on the Shuttle.

The Marshall Space Flight Center in Huntsville, Ala., has responsibility for two of the science payloads scheduled for 1989. They are the Hubble Space Telescope, one of NASA's highest priorities and a cooperative project with the European Space Agency (ESA); and Astro-1, a Marshall-managed Spacelab mission carrying an ultraviolet observatory. Both are scheduled for launch aboard the Shuttle in June.

The other two science missions scheduled for the Shuttle in 1989 are Magellan, which will map Venus with a high-resolution radar, in April and Galileo, a cooperative project with Germany to make the first comprehensive survey of Jupiter and its moons, in October.

In addition, the Cosmic Background Explorer, a mission to investigate cosmic background noise, is planned for launch on a Delta in February 1989. NASA also will accelerate deployment of other space science missions by fully utilizing ELVs.

For example, the Roentgen Satellite is planned for launch on a Delta in February 1990, and the Extreme Ultraviolet Explorer is planned for launch on a Delta in August 1991.

In October 1990, the cooperative ESA/NASA Ulysses mission, to observe the polar region of the sun, is scheduled to be launched on the Shuttle.

The reformatted launch schedule released today includes Space Shuttle missions through STS-44; projected ELV flight assignments; flight histories for the Shuttle and ELVs; and a summary of payload requests for flight assignments.

The ELV payload flight assignment schedule projects the target launch date, class of vehicle and, if assigned, designated vehicle. It also includes the required orbit and inclination, launch site and payload. Since ELV flights are projected through 1995, some are included which have yet to receive formal budget approval.

The previous flight section reflects histories for Space Shuttle missions and Atlas Centaur, Delta and Scout launches.

Secondary payloads, including some commercial activities, will be added to the launch schedules as they are formally assigned.

A manifest for Space Shuttle flights beyond 1990 will be issued following decisions regarding launch vehicle assignments for certain DOD payloads compatible with both Space Shuttle and ELV's.

- end -

Copies of the Manifest are available at the Marshall Space Flight Center Public Affairs Office.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release

Bob Lessels
Marshall Space Flight Center
Huntsville, Ala.
(Phone: 205/544-0034)

Oct. 22, 1987

Jim Ball
Headquarters, Washington, D.C.
(Phone: 202/453-1922)

Mark Hess
Headquarters, Washington, D.C.
(Phone: 202/453-1175)

NOTICE TO BUSINESS EDITORS

INDUSTRY EXECUTIVES TO CONSIDER COMMERCIAL USE OF SPACE STATION

A group of senior corporate executives representing diverse industries will gather in Nashville, Tenn., Nov. 3-5 to discuss the potential commercial uses of the Space Station.

More than 200 participants, representing a broad variety of American industrial concerns, will attend the NASA-sponsored meeting and exchange ideas with space agency officials on how the Space Station can help serve the future needs of industry.

While many companies attending the workshop have initiated space-related research programs, others that have had little or no past involvement with space are interested in exploring the

-More-

potential offered by the Space Station.

Input from the industry representatives will be used in formal NASA reviews of Space Station user requirements as work proceeds towards detailed design and development of the orbital facility.

Because of the widely varied commercial interest in the Space Station, the business media are invited to attend the workshop. All plenary sessions and social events also will be open for news media attendance.

A press conference is scheduled for 10:30 a.m., Nov. 3 at the workshop press room, Vanderbilt Plaza Hotel, 2100 West End Ave., Nashville.

Participants will include Andrew Stofan, NASA associate administrator, Office of Space Station; James Rose, NASA assistant administrator, Office of Commercial Programs; and Edward Donley, chairman, Business - Higher Education Forum and chairman of the executive committee of the Board of Directors, Air Products and Chemicals, Inc.

News media representatives also are invited to attend a press briefing on NASA's Centers for the Commercial Development of Space at 2 p.m., Nov. 4, in the press room.

Providing an overview of these unique research institutions, sponsored and supported by both NASA and industry, will be Dr. William Oran, NASA, and representatives of the Center for the Space Processing of Engineering Materials, located at Vanderbilt University, Nashville, and the Center for Advanced Space

Propulsion, located at the University of Tennessee Space Institute, Tullahoma.

A workshop agenda and listing of industry working groups are attached. Those interested in attending the conference should contact NASA for further details.

WORKSHOP AGENDA

NOVEMBER 2 INFORMAL REGISTRATION AND RECEPTION

NOVEMBER 3

8:30	Introductory Remarks	Richard E. Halpern
8:40	Space Station Overview	Andrew J. Stofan
9:10	Office of Commercial Programs	James T. Rose
9:40	Industry Perspective	Edward Donley
10:10	Break	
10:30	Attributes of Space	David C. Webb

(10:30 - 11:00 Press Conference)

11:10	International Activities	Hans E.W. Hoffman
12:00	Lunch - Competitiveness & The Space Frontier	
1:30	Extraction Industry Working Group	

-More-

2:30	Fabrication Industry Working Group	
3:30	Break	
3:40	Service Industry Working Group	
4:40	3M Experience	Dr. Chris Podsiadly
5:00	Astronaut Experience	Bonnie Dunbar
5:45	Cocktail Reception	

NOVEMBER 4

8:30	Introductory Remarks	Richard E. Halpern
8:40	Space Station Technical Overview	Dr. John-David F. Bartoe
9:40	Materials Processing Panel	Kathryn F. Schmoll
10:30	Break	
10:40	Earth & Observation Panel	Shelby G. Tilford
11:20	Industrial Services Panel	Earle Huckins
12:00	Lunch - A Congressional Perspective	The Hon. Robert S. Walker
1:30	Space Station Utilization	Richard E. Halpern
2:00	Working Sessions	
2:00	Press Briefing on NASA Centers for Commercial Development of Space	
5:00	Break	
6:00	Dinner	

-More-

NOVEMBER 5

8:30 - 11:15 Working Sessions

11:15 Break

11:30 Materials Processing Summary Kathryn Schmoll

11:50 Earth and Ocean Observation

Summary Shelby Tilford

12:10 Industrial Services Summary Earle Huckins

12:30 Wrap-Up Summary

INDUSTRY WORKING GROUPS

(Preliminary)

EXTRACTION

Dr. Frederick Henderson, III	The GEOSAT Committee
Mr. William A. Griffith	Helca Mining Company
Dr. Norm Johnson	Weyerhaeuser Company
Dr. Ted Jones	Chevron Research
Mr. James Van Hoften	Bechtel National, Inc.

FABRICATION

Dr. Edward Trachman	Rockwell International
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-More-

Dr. J. Lawrence Fox

Abbott Laboratories

Mr. Lewis Lherbier

Cyclops Industries

Dr. David McGee

Biosource Genetics Corp.

Mr. John Rehnberg

The Perkin Elmer Corporation

Mr. Simon Yin

Square D Co.

Mr. Gordon Starr

Cummins Engine Company

SERVICES

Dr. Robert Bell

Consolidated Edison Co. of NY

Dr. Thomas Frist, Jr.

HCA

Mr. Samuel Fuller

Digital Equipment Corporation

Dr. Lou Lanzerotti

AT&T

Dr. Peter Vardy

Waste Management Inc.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release

Barbara Selby
Headquarters, Washington, D.C.
(Phone: 202/453-8536)

October 22, 1987

Bob Lessels
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Huntsville, Ala.
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RELEASE: 87-128

NASA SELECTS SHUTTLE-C STUDY CONTRACTORS

NASA today announced selection of Martin Marietta Manned Space Systems, New Orleans, La.; Rockwell International, Space Transportation Systems Division, Downey, Calif.; and United Technologies Corp., USBI Booster Production Co., Inc., Huntsville, Ala., for negotiations leading to parallel contract awards to perform the first of a two-phase systems definition study for a proposed unmanned, cargo-carrying launch vehicle.

The first study phase, valued at approximately \$1.5 million for each of the firms, is expected to require four months to complete. Each contractor will prepare

(MORE)

configuration and operations concept definitions. The Shuttle-C concept is to supplement the orbiter with an unmanned cargo element.

The new vehicle, named the Shuttle-C for cargo, would have a lift capability of 100,000 to 150,000 pounds to low-Earth orbit, giving the U.S. space program a launch vehicle with two to three times the payload capability of the present Space Shuttle.

Systems definition efforts will focus on vehicle configuration details including the cargo element's length and diameter, the number of liquid-fueled main engines as well as an operations concept evaluation including ground and flight support systems.

Phase II, a priced option, if exercised, will focus on refinement of the selected configuration and operations concept with the generation of preliminary designs and systems definition.

A major purpose of the study is to determine whether Shuttle-C would be cost effective in supporting the Space Station. Use of the Shuttle-C could free the Space Shuttle for STS-unique missions such as solar system exploration, astronomy, life sciences, Space Station crew rotation, and logistics and materials processing experiments. Shuttle-C

(MORE)

also would be used to launch planetary missions and serve as an unmanned test bed for new Shuttle boosters.

The results of the Shuttle-C efforts will be coordinated with the other ongoing advanced launch system studies to enable the joint steering group, comprised of Department of Defense and NASA senior managers, to formulate a national heavy lift vehicle strategy that best accommodates both near-term requirements and longer-term objectives for reducing space transportation operational costs.

NASA's Marshall Space Flight Center, Huntsville, Ala., has management responsibility for the Shuttle-C study effort.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release

Jim Sahli
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Nov. 4, 1987

RELEASE NO: 87-129

MARSHALL SCIENTISTS LAUNCH SECOND SUPERNOVA 1987a BALLOON

Scientists from Marshall Space Flight Center in Huntsville, Ala. and Lockheed's Palo Alto (Calif.) Laboratory successfully launched the first of four planned balloon-borne investigations from Alice Springs, Australia, Oct. 29 to study Supernova 1987a (SN 1987a), an exploding star 170,000 light years from Earth.

The 28.4 million cubic-foot helium-filled balloon carrying a 1,500 pound scientific instrument package that could detect the first gamma ray line emissions from SN 1987a, lifted off at 3:21 a.m. (CST) Oct. 29 and rose to 130,000 feet. Scientists will analyze the results and have a preliminary report of their findings in about a month.

The scientists traveled to Australia on a similar scientific expedition last May but did not detect any gamma ray emissions

-More-

from the supernova. This time, however, they are better equipped and will have a much better chance of detecting gamma rays from supernova 1987a, according to Dr. Gerald J. Fishman of Marshall's Space Science Laboratory, who is leading the Marshall scientific team to Australia. Marshall scientists believe the supernova envelope has spread wider since the May balloon experiment and the expected radiation may now be observable, he said.

"We are excited that we will have a better chance to spot X-ray and gamma rays from the supernova. We will be flying higher and longer with an additional detection system and a better pointing system," said Fishman.

The Marshall team left for Australia Oct. 10. Their equipment was trucked to Atlanta, flown to Sydney, Australia, and then trucked overland to Alice Springs, located in central Australia.

"The winds will be a positive factor on this trip. In May, we had winds aloft up to 80 knots. For this launch, we are expecting only 10-20 knot winds. We had to bring the last balloon down after only nine hours of flight because it was nearing the east coast of Australia. This time we will be able to keep it aloft 20-40 hours. This gives us more time to view the supernova," said Fishman before leaving for Australia. Early reports from Australia indicate that the balloon stayed aloft for 38 hours.

Marshall is teaming with the Palo Alto Laboratory to conduct the study. Lockheed is providing the sensitive gamma ray detector and Marshall Center is supplying the gondola that carried the

-More-

scientific equipment.

"There have been improvements in the Lockheed gamma ray detector pointing system," said Fishman. "Also, we have added two Burst and Transient Source Experiment (BATSE) developmental detectors to the Lockheed gamma-ray detector. These two improvements will assist us in detecting gamma rays," said Fishman.

The BATSE experiment is a gamma ray monitoring experiment designed primarily for the detection and detailed study of gamma ray bursts and other transient high-energy sources. Eight BATSE detectors will be positioned on NASA's Gamma Ray Observatory (GRO) that will be deployed in the future from the Space Shuttle.

The 20-story-tall, helium-filled balloon carrying the experiment package in Australia rose above most of the Earth's atmosphere and then pointed its instruments at the supernova to detect any possible gamma ray emissions. The instruments were also pointed at the Crab Nebula, a remnant of a supernova that occurred in the 1500's, which is a known gamma-ray emitter. During the expedition in May the balloon ascended to a height of 122,000 feet.

"Gamma rays can't penetrate the Earth's atmosphere; that's why we have to use high-altitude balloons to study them," said Fishman.

The supernova, located about 170,000 light years away, is at a declination of 69 degrees south and can only be observed in the southern hemisphere. A single light year, the distance light

-More-

travels in a year, equals 5.8 trillion miles.

NASA's Deep Space Network station near Canberra, Australia, configured with Australia's Parkes Radio Observatory, has been observing radio wave emissions from the supernova.

Members of the Australian expedition from Marshall include: Dr. Fishman, Dr. Robert B. Wilson, W. Thomas Sutherland, and Robert W. Austin.

The Marshall and Lockheed scientists form one of four teams that will conduct NASA-sponsored experiments from Alice Springs between now and December.

In addition to Marshall's balloon launch, three other NASA-sponsored balloon experiments will be conducted at Alice Springs this fall. Teams from the University of California-Riverside, California Institute of Technology and the Jet Propulsion Laboratory in Pasadena, Calif., will conduct those experiments.

NASA also plans to launch X-ray and ultraviolet experiments on sounding rockets from Woomera, Australia, about 600 miles south of Alice Springs, and to conduct infrared experiments from NASA's Kuiper Airborne Observatory (KAO), a converted C-141 jet cargo plane, from Christchurch, New Zealand, in November.

The KAO arrived in New Zealand November 2. Expedition manager Louis Haughney of NASA's Ames Research Center, Calif., has planned eight flights in November.

Pennsylvania State University's sounding rocket experiment designed to search for X-ray emissions arrived at Woomera Oct.

-More-

28. Barring unforeseen obstacles, it will be launched November 12, according to W.A. Brence, the sounding rocket campaign manager for NASA at Woomera.

The balloon, sounding rocket and airborne campaign is a continuation of a two-year program that began in May to study SN 1987a. In April the KAO conducted observations of the supernova during flights from Christchurch and scientists at Alice Springs launched three successful balloon missions. At that time, scientists verified theoretical models which predicted X-rays and gamma rays were still being contained within the outer part of the star.

Since then, instruments aboard the Japanese satellite Ginga and aboard the Soviet space station Mir have detected hard X-rays from the supernova. As a result, scientists have theorized that gamma rays should begin to emerge from the supernova.

SN 1987a was discovered in February of this year from an observatory in Chile, with major confirmation from the Australian observatories at Siding Spring and Parkes and from NASA's International Ultraviolet Explorer satellite.

NASA News

National Aeronautics and
Space Administration

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For Release:

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Oct. 30, 1987

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RELEASE NO: 87-132

SUBJECT: NASA SELECTS SMALL BUSINESS RESEARCH PROPOSALS

NASA announced today the selection of 206 research proposals for immediate phase I award negotiations in its 1987 Small Business Innovation Research Program (SBIR). Included are 169 small, high technology firms located in 29 states, including Alabama and Tennessee.

NASA's Marshall Space Flight Center, Huntsville, Ala., will negotiate 28 awards with 24 firms. Eleven of the firms with which NASA will negotiate are in the Alabama-Tennessee region.

(MORE)

SBIR objectives are to stimulate technological innovation in the private sector, strengthen the role of small business participation (including minority and disadvantaged firms) in federal research and development programs and to contribute to the growth and strength of the U.S. private sector.

These SBIR phase I awards were selected competitively on the basis of scientific and technical merit and value to NASA from 1,744 proposals received in response to the SBIR solicitation which closed June 19, 1987. This is the fifth year of phase I selections made by NASA in accordance with Public Law 97-219, the Small Business Innovation Development Act of 1982.

Phase I projects are 6-month, fixed-price contract efforts to establish the feasibility of innovative research concepts. Projects showing greatest promise are eligible to compete for Phase II follow-on contracts of up to 2 years in duration to continue development. Approximately one-half the phase I projects may be selected for phase II. Work beyond phase II would be funded either by commercial firms or by specific government programs outside SBIR funding.

As required by law, NASA allocates 1.25 percent of its annual research and development budget for SBIR. Approximately \$10.3 million of NASA's 1988 SBIR allocation will be used for this phase I procurement. The program is managed by NASA's Office of Commercial Programs, NASA Headquarters, Washington, D.C. All procurements are conducted by eight NASA field centers.

(MORE)

The following regional firms were selected for negotiation of SBIR phase I contracts:

ALABAMA

APPLIED RESEARCH INC., HUNTSVILLE

CFD RESEARCH CORP., HUNTSVILLE

CHAM OF NORTH AMERICA INC., HUNTSVILLE

ELECTRO DESIGN MANUFACTURING, DECATUR

REMTECH INC., HUNTSVILLE

TENNESSEE

ADVANCED CONTROL TECHNOLOGIES, NASHVILLE

ATOM SCIENCES INC., OAK RIDGE

MID SOUTH ENGINEERING INC., NASHVILLE, TN

QCI INC., OAK RIDGE

SEES INC., KNOXVILLE

TELEROBOTICS INT., KNOXVILLE

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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For Release

Nov. 16, 1987

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RELEASE NO. 87-139

MARSHALL STUDYING ADVANCED RECOVERY SYSTEM

NASA's Marshall Space Flight Center at Huntsville, Ala., has awarded a \$3,000,000 contract to Pioneer Systems, Inc., of Manchester, Conn., and Melbourne, Fla., to conduct a second phase of studies of an advanced recovery system to be used in conjunction with future launch vehicles currently under consideration.

Phase one of the advanced recovery systems study, conducted by Pioneer Systems and United Technologies Corp.'s Space Flight Systems Division in Huntsville, Ala., has shown the potential for a new system to provide precision touchdown for large, high-value, reusable launch vehicle components. While the applications may be extended to other programs, such as orbiting payloads and Space Station logistics (manned or unmanned), the primary aim of these studies is to evaluate the application to recovering the expensive propulsion and avionics module of future launch vehicles undamaged at a preselected land touchdown site. A land-based recovery system

-more-

would eliminate current concerns about salt-water corrosion damage to high value components and would simplify return logistics to the launch site.

The next step of the study, phase II, into which the Marshall Center team is now moving, will involve experiments to demonstrate this recovery system's capability. A demonstration test plan will be prepared by the contractor and approved by the Marshall Center. It is anticipated the demonstration test will show, through a series of drop tests from aircraft, the capacity of the selected recovery system to provide precision soft landing capability for a 20,000 pound subscale payload with applications to full-scale payloads, weighing 60,000-70,000 pounds. Appropriate subsystem and component tests will be included beforehand to ensure mission success.

Test of this type of recovery system is expected to represent a significant advance in technology verification for precision recovery methods.

If the tests are successful, the new recovery system could be implemented in the design of operational flight vehicles in the mid- to late-1990s. Program officials said additional devices may be used to slow the payloads from supersonic to subsonic speeds before deployment of the Propulsion/Avionics Module advanced recovery system. Program planners are aiming at a system which combines low cost with high reliability.

NASA News

National Aeronautics and
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For Release:

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Nov. 27, 1987

RELEASE NO: 87-145

SAUCIER NAMED MANAGER OF SPECIAL PROJECTS OFFICE

Sidney P. Saucier of Huntsville has been named manager of the Special Projects Office at the Marshall Space Flight Center in Huntsville, Ala. He has served as deputy manager of the office since November 1986.

The Special Projects Office is currently assigned responsibility for the Inertial Upper Stage, Transfer Orbit Stage, the Payload Assist Module, the Orbital Maneuvering Vehicle, the Tethered Satellite System, and the Combined Release and Radiation Effects Satellite projects.

Saucier joined the Marshall center in June 1962 as a propulsion and power engineer in the former Propulsion and Vehicle Engineering Division. He subsequently held engineering and technical management positions of increasing responsibility, including that as project engineer for the RL-10 hydrogen/oxygen engine in the former Propulsion and Vehicle Engineering Laboratory.

He transferred to the Program Development Directorate when it was established in 1969, where he had overall responsibility for planning and developing engineering analyses and studies directed toward the definition of space transportation and exploration systems.

In 1977, he became the NASA-Marshall Space Flight Center representative for the Inertial Upper Stage at Air Force Space Division and its predecessor organization in Los Angeles.

In October 1980, Saucier returned to Huntsville as deputy manager of the Inertial Upper Stage Project in the Special Projects Office.

Saucier was appointed manager of the Inertial Upper Stage Project in October 1982 and assumed the added responsibility as manager of the Transfer Orbit Stage Project in December 1985.

He was awarded the NASA Exceptional Service Medal in 1985 for his management of the IUS Project activities which led to the successful mission of the IUS on STS 51-C.

Saucier is chairman of the Huntsville-Madison County Airport Authority and a member of the Huntsville-Madison County Chamber of Commerce Executive Board of Directors.

He and his wife, Pat, have three children.

NASA News

National Aeronautics and
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For Release:

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December 2, 1987

RELEASE NO: 87-148

MARSHALL CENTER TO CONDUCT STRUCTURAL TESTS ON REDESIGNED SPACE SHUTTLE BOOSTER ELEMENTS

NASA's Marshall Space Flight Center in Huntsville, Ala., is scheduled to begin a series of structural tests this week on the Space Shuttle solid rocket booster. The tests, to be performed on hardware referred to as Structural Test Article-3, will be conducted over a three-month period in Marshall's East Test Area.

This solid rocket booster test series will verify the structural integrity of the Shuttle booster's redesigned motor case, redesigned external tank attach ring and redesigned aft skirt. During testing, maximum loads and internal motor case pressures, simulating those expected during pre-launch and flight of the Space Shuttle, will be applied to the test article.

The test article to be used is a shortened version of the Shuttle booster using full scale hardware. The test article consists of a forward dome with igniter plate, two capture feature segments, modified external tank attach cylinder, two 120-inch

-more-

stiffener segments, aft dome, nozzle closure, external tank attach ring, dummy forward skirt and aft skirt.

Morton Thiokol will supply the motor case and hardware, and United Space Boosters, Inc./Booster Production Company will supply the 360-degree external tank attach ring and booster aft skirt.

The testing is part of a series of solid rocket booster tests being conducted at the Marshall Center as part of NASA's overall effort to return the Space Shuttle to flight.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Barbara Selby
Headquarters, Washington, D.C.
(Phone: 202/453-8536)

December 3, 1987

Jerry Berg
Marshall Space Flight Center
Huntsville, Ala.
(Phone: 205/544-0034)

RELEASE: 87-149

ACCEPTANCE TESTS COMPLETED FOR TWO SHUTTLE ENGINES

Full-mission-duration tests of Space Shuttle main engines 2022 and 2019 have been successfully conducted, completing the acceptance testing of the first two engines to fly on the next Shuttle mission.

The 520-second tests were conducted Nov. 21 on engine 2022 and Nov. 28 on engine 2019 at NASA's National Space Technology Laboratories (NSTL), Bay St. Louis, Miss. The tests were followed by complete examinations of the engines and analysis of test data, all of which showed that the engines performed within established standards.

"This is a major milestone and keeps us on course to deliver three engines within Kennedy Space Center's requirement for a June Shuttle flight," said Jerry Smelser, deputy engine project manager

-more-

at Marshall Space Flight Center. The Marshall Center manages the main engine program for NASA.

At each stage of the test sequence, physical examination of the engines included checking for leakage from the oxidizer heat exchanger. It was leakage in that component which appeared in engine 2027 after its full-duration firing Oct. 10. The leak resulted in pulling engine 2027 from the lineup for STS-26. There has been no sign of leakage in engine 2022, and inspection of 2019 is in process.

"So far, we've accomplished six of the nine tests required prior to delivery of the three engines," Smelser said.

The third engine slated for the STS-26 is being prepared to begin its three-test sequence of firings. It has been installed on the test stand from which engine 2022 was just removed.

Officials expect acceptance of the three flight engines for STS-26 to be completed in time for delivery to Kennedy Space Center prior to the first week of January.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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For Release:
December 11, 1987

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RELEASE NO: 87-151

NOTE TO EDITORS/NEWS DIRECTORS

The second full-duration test firing of NASA's redesigned Space Shuttle solid rocket motor is scheduled for Saturday, Dec. 19, at Morton Thiokol's Wasatch Operations in Utah. In addition to the attached news release and fact sheet on this test, designated DM-9, other services will be available to assist the news media with coverage of test activities. These include a press tour of the motor (10 to 10:45 a.m. MST), pre-test briefing (11 a.m. to noon MST), the actual motor test firing (1 p.m. MST), and a post-test briefing (2 to 3 p.m. MST).

There will be no live NASA Select Television coverage of DM-9 test activities. However, an audio feed of the briefings and test will be available in the NASA newsrooms at Headquarters, Marshall Space Flight Center, and Johnson Space Center. A direct audio feed will also be available by calling the Marshall Center Communications Office at 205-544-5300. Audio connections will also be available to media on-site at the NASA/Morton Thiokol DM-9 newscenter.

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This joint NASA/Morton Thiokol newscenter will be in operation from 8 a.m. to 5 p.m. (MST) on Friday, Dec. 18, the day prior to the test, and again on test day. The pre- and post-test briefings will originate from this newscenter. The newscenter is located at the Morton Thiokol test observation area, about 22 miles west of Brigham City, along Utah Highway 83. It consists of a five-trailer complex with workspace and telephones for media use. NASA and Morton Thiokol representatives will man a news desk in the newscenter on the two days mentioned above. Telephone numbers for the news desk are 801-863-6880 through 6885.

For those media representatives planning to attend the test-day activities at Morton Thiokol, no advance accreditation is required. However, a courtesy call to the Morton Thiokol Public Relations Office, 801-863-3955, is requested to confirm the number of reporters and crew members attending. Current media credentials will be required to gain access to the newscenter and test observation site.

For additional information concerning DM-9 media activities, contact Rocky Raab at Morton Thiokol, 801-863-2747; or Ed Medal at the NASA Marshall Space Flight Center in Huntsville, Ala., 205-544-0034.

NASA News

National Aeronautics and
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December 11, 1987

RELEASE NO: 87-151

SECOND REDESIGNED SHUTTLE ROCKET MOTOR SCHEDULED TO BE TEST FIRED DECEMBER 19

The second full-duration test firing of NASA's redesigned Space Shuttle solid rocket motor is scheduled for 1 p.m. MST Saturday, Dec. 19, at Morton Thiokol's Wasatch Facility near Brigham City, Utah.

The test is part of the Shuttle motor redesign program. Four full-duration tests of the motor are required prior to the planned resumption of Shuttle flights in June 1988. This test will be the second of those four.

Morton Thiokol is NASA's prime contractor for the solid rocket motor, and the Marshall Space Flight Center in Huntsville, Ala., manages the motor program for NASA.

The 126-foot long, 1.2-million pound motor, designated Development Motor-9 (DM-9), will undergo a full-duration horizontal test firing of two minutes. The test is designed to further evaluate the performance of major design features of the redesigned solid rocket motor, including the capture feature field

-more-

joint, bonded field joint insulation, joint heaters and radially bolted case-to-nozzle joint design.

Test data during the firing will be obtained from more than 500 instruments on the motor. Instruments will measure such things as acceleration, pressure, deflection, thrust, strain, temperature, and electrical properties.

The first full-duration test of a redesigned motor took place when the DM-8 motor was fired on Aug. 30. That firing, according to NASA and Morton Thiokol officials, was a complete success.

The DM-9 motor is very similar to DM-8. The difference consists of minor changes, primarily in the motor exhaust nozzle and bonded insulation. DM-9 contains virtually all of the proposed flight-configuration designs, where DM-8 was about 90 percent of flight-configuration.

A successful test firing of DM-9 will pave the way for the final two motor firings, Qualification Motors 6 and 7 (QM-6 and QM-7). Those firings are scheduled next spring.

DM-9 FACT SHEET

Description

The DM-9 motor consists of 11 major steel case sections preassembled into four major casting segments. Each of the forward three segments includes a case section with the new capture feature tang at the aft end of the segment. The tang mates with a slightly modified but original configuration clevis at the forward end of the next segment, forming a field joint. The aft end of the aft segment contains a steel case section (aft dome) with the redesigned radial bolt case-to-nozzle factory joint.

All three field joints incorporate an electrical joint heater. The heaters are designed to keep the O-ring area of the field joints at a minimum of 75 degrees F.

DM-9 Configuration

DM-9 is a full-size Space Shuttle solid rocket motor, approximately 126 feet in length and 12 feet in diameter. The motor weighs about 1.2-million pounds, including about 1.1-million pounds of propellant.

The three field joints which connect the four casting segments are of the redesigned capture feature tang and clevis

design with three Viton (TM) O-rings. The mating insulation surfaces at each field joint are bonded with an adhesive, and include a J-shaped deflection relief slot to reduce stresses and increase the sealing action of the bonded surfaces under motor pressure.

Joint heaters are mounted around the motor case at each field joint location. Each heater contains two independent electrical power circuits thermostatically controlled to maintain joint temperatures at a minimum of 75 degrees F. An extensively instrumented 360-degree external tank attach ring will be mounted on the case just aft of the aft field joint.

The motor case-to-nozzle joint is of the redesigned configuration with 100 radial bolts added. The 7/8-inch diameter radial bolts with Viton Stat-O-Seals (TM) are added to minimize the amount of joint opening during motor pressurization. The joint also incorporates adhesively bonded insulation surfaces, a shaped relief slot and an added Viton "wiper" O-ring designed to keep the adhesive on the insulation surfaces during assembly.

The exhaust nozzle incorporates added leak test ports and a throat inlet assembly with revised contour. Being tested again on DM-9 are ply-angle changes in several parts of the exhaust nozzle. Ply-angle refers to the angle at which composite tape is wound onto a shaped mandrel during nozzle manufacture. Changed ply-angles have been shown in previous firings, including DM-8, to provide better control of nozzle material erosion during firing. Another feature being used on DM-9 is a backfill technique for applying sealant into the nozzle exit cone attachment joint, the

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forward exit cone to throat inlet joint, and the joint between the throat and nose inlet assembly.

A standard aft skirt containing thrust vector control equipment is fitted to the motor. Special ground support equipment will be used to heat this aft skirt, similar to the way aft skirts will be heated during future KSC launch operations.

The DM-9 motor is fitted with more than 500 instruments to measure acceleration, pressure, deflection, thrust, strain, temperature, electrical properties and other conditions.

DM-9 Test Objectives

Some of the primary test objectives for DM-9 are to evaluate:

Performance of the capture feature field joint design.

Performance of the bonded J-seal insulation design.

Performance of radially bolted case-to-nozzle joint hardware.

Performance of unvented case-to-nozzle joint insulation.

Performance of the redesigned nozzle components.

RTV backfill of nozzle joints.

Aluminum systems tunnel bondline integrity.

Structural integrity of external tank attach ring under motor pressurization loads.

Joint protection systems for factory and field joints.

Overall thrust vector control effects of a thermally conditioned aft skirt.

NASA News

National Aeronautics and
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SHUTTLE CREW TRAIN ON SECONDARY PAYLOAD, PREPARE FOR JUNE MISSION

Though the world's eyes may be focused on the Space Shuttle launch next June, an important part of the mission will be the secondary payload experiments to be performed on the Shuttle middeck in space.

The crew for the next Space Shuttle mission, STS-26, visited the Marshall Space Flight Center in Huntsville, Ala., Dec. 15, receiving briefings and training on performing some of those secondary payload experiments.

"The middeck of the Space Shuttle is very large and can provide laboratory space for research in a number of fields", explained Dr. George D. "Pinky" Nelson, mission specialist on STS 26. "We're lucky enough to have 11 different experiments on-board, seven of which are managed at the Marshall Space

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Flight Center. They cover fields ranging from materials processing to communications experiments and experiments looking at lightning," he said.

The visiting crew consisted of Shuttle Commander Rick Hauck, pilot for STS 7 (June, 1983) and spacecraft commander for STS 51A (November, 1984); Pilot Richard O. Covey, pilot for STS 51I (August, 1985); Mission Specialists David C. Hilmers, who flew on STS 51J (October, 1985); John M. (Mike) Lounge, STS 51I (August, 1985); and Dr. Nelson, a veteran of both STS 41C (April, 1984) and STS 61C (January, 1986).

"We've been going through checklists; finding mistakes, taking out things that are confusing; and getting things ready so that next June, when we launch, we can carry out our main missions which are not only to deploy NASA's Tracking and Data Relay Satellite (TDRS) and land safely, but to perform some significant science aboard," Nelson said.

The seven experiments with which Marshall is involved are:

* Automatic Directional Solidification Furnace -- a technology demonstration of directional solidification of magnetic materials, immiscibles and infrared detection materials (sponsored by NASA's Office of Space Science and Applications [OSSA], development and mission management by Marshall Center).

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* Physical Vapor Transport of Organic Solids -- a materials research experiment of the 3M Corp., St. Paul, Minn., to grow crystalline films on selected substrates of organic solids (sponsored by NASA's Office of Commercial Programs [OCP], mission management by Marshall Center).

* Protein Crystal Growth -- utilizes the weightless environment of space flight to grow protein crystals of a size and quality needed to determine the molecular structure of the proteins. Such information is essential for understanding protein functions, synthesis and for drug design (co-sponsored by OCP and OSSA, development and mission management by Marshall Center).

* Isoelectric Focusing Experiment -- designed to gather data on the extent of electro-osmosis in space (sponsored by OSSA, development and mission management by Marshall Center).

"The Isoelectric Focusing Experiment is a biomedical experiment using electric fields to separate materials", according to Dr. Nelson. "During the process, when a sample is applied to a static electric field, it acts almost like magic, separating these materials into bands, which can be picked out as a pure sample," he said.

* Handheld Microgravity Experiment -- a category of simple experiments to study low gravity effects on selected physical

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processes. This STS-26 experiment, called Phase Partitioning Experiment, will study the physics associated with the separation of two-phase polymer solutions (in this case, dextran and polyethylene glycol), which could lead to a better understanding of a method used in separating biological cells (sponsored by OSSA, development and mission management by Marshall Center).

* Aggregation of Red Blood Cells -- an experiment to study aggregation of red cells and blood viscosity under low-gravity conditions (sponsored by OSSA, mission management by Marshall Center).

* Mesoscale Lightning Experiment -- TV and photographic data will be collected to survey the lightning activity occurring simultaneously and separated by large distances. This data will be used to establish a better understanding of lightning and its relationship to severe weather development (sponsored by OSSA, concept development by Marshall Center).

The primary payload to be carried aboard Discovery during the mission is NASA's Tracking and Data Relay Satellite. The satellite will be launched from the Shuttle's cargo bay on an inertial upper stage (IUS), another Marshall Center-managed program.

NASA News

National Aeronautics and
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MARSHALL SCIENTISTS BALLOON EXPERIMENTS HELP ADVANCE THE UNDERSTANDING OF SUPERNOVAS

Scientists announced Dec. 16 a major advance in the study of explosive nucleosynthesis -- the creation of heavier elements out of lighter elements in the explosion of a supernova. Iron and other heavier elements are part of the composition of planets and moons in the solar system and also are found in plants and animals on Earth.

Marshall Space Flight Center scientists in Huntsville, Ala. shared in the announcement. A team from Marshall's Space Science Laboratory went to Australia in October to conduct balloon experiments to gether information which led to this advancement.

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"This revelation will tell us more about the construction of of the elements of our universe," said Dr. Charles A. Meegan, of Marshall's Space Science Laboratory.

The advance occurs with the first direct observational detection of gamma-ray emissions from radioactive cobalt produced in the supernova 1987A explosion. This evidence comes from three independent sources and confirms an astrophysics theory widely held since the 1950's.

Supernova 1987A occurred in the Large Magellanic Cloud, a satellite galaxy to our own Milky Way which appears in the Southern Sky.

The observational evidence is from the Solar Maximum Mission (SMM) satellite, which began observations beginning in August and from two balloon-borne experiments flown in October and November from Alice Springs, Australia, as part of NASA's Fall Supernova Observation Campaign.

The observations were made by SMM's gamma-ray spectrometer, one of seven instruments on the spacecraft. The Spectrometer was designed and built by both U.S. and Federal Republic of Germany scientists. Dr. Edward L. Chupp, University of New Hampshire, Durham, N.H., is the principal investigator.

The balloon instruments are the most sensitive gamma-ray detectors ever flown. They confirm the earlier detection of gamma rays from radioactive cobalt by the SMM gamma-ray detector and add important new information. With the higher spatial resolution, the balloon experiments were able to identify the source of the gamma-ray emission to be the supernova rather than

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another nearby star. Also, the improved energy resolution of the balloon experiments allowed identification of the gamma-ray emissions from the radioactive cobalt produced in the supernova.

The Marshall team consisting of Dr. Gerald J. Fishman, Robert W. Austin, Dr. Robert B. Wilson and W. Thomas Sutherland, all from Marshall's Space Science Laboratory, launched a 28.4 million cubic-foot helium-filled balloon to a height of 130,000 feet on Oct. 29. The balloon carrying a 1,500 pound instrument package remained aloft for more than 38 hours before scientists recovered the balloon 200 miles north of Alice Springs.

The balloon experiments were a combined high-resolution gamma-ray and hard X-ray instrument from Lockheed's Palo Alto Research Laboratory, Palo Alto, Calif., and Marshall Center, and an imaging gamma-ray telescope from the California Institute of Technology, Pasadena, Calif. CalTech had the second balloon experiment.

The Marshall/Lockheed instrument principal investigators are Dr. Gerald J. Fishman and Dr. William G. Sandie. The Caltech instrument principal investigator is Dr. Thomas A. Prince.

In the tremendous energy released in a supernova, heavier elements are created from the lighter elements of the exploding star. The energy causes nuclear reactions where silicon is changed into radioactive nickel and cobalt and other heavy elements. Because this is the closest supernova to Earth to be visually observed in close detail in nearly 400 years, the detection of gamma rays was crucial to confirming the theory of nucleosynthesis.

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Although there are supernovas detected every year by astronomers, they are too far away for gamma-ray emissions to be observed.

Gamma rays are released as the radioactive elements formed in the explosion decay. When stars explode, nuclear reactions in the core of the star produce radioactive nickel, cobalt and titanium. The nickel quickly decays into cobalt which subsequently decays into stable iron. The decay process produces unique gamma rays and because of this, the gamma rays are a direct measure of the amount and kind of radioactive material. Because the gamma rays have to travel through the expanding nebula of exploded star matter, they also are a measure of the nature and composition of the nebula itself. Somewhat less than one percent of the matter in Sanduleak-69 202 (the progenitor star) was converted into radioactive cobalt. This cobalt will decay over several years into stable iron.

These three observations (the SMM and two balloon experiments) confirm and extend earlier evidence from the Japanese Ginga X-ray satellite and the Soviet Mir observations of hard X-rays. The U.S. observations are the first at the higher gamma-ray energy wavelengths.

The hard X-rays were indicative of gamma-ray emissions but were not direct evidence of nucleosynthesis. Hard X-rays are produced by Compton scattering within the expanding nebula. Compton scattering is the process which causes gamma rays to be scattered off hydrogen and helium atoms in the nebula, thereby losing enough energy to be converted into X-rays. The Ginga and

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Mir observations were important as they helped describe the condition of the expanding shell.

Additional balloon observations in both hard X-ray and gamma-ray wavelengths are planned by NASA for the Spring of 1988. These observations are as important as the ones already accomplished because they will help describe the evolution of the remnant star and the expanding nebula. The continuing observations also are critical for filling in important details of the theories involved in explaining the supernova process and the various aspects of nucleosynthesis. The basic theory, though, has been strikingly confirmed by the observations. In the meantime, the SMM satellite will continue to observe the supernova.

The SMM satellite is managed by NASA's Goddard Space Flight Center, Greenbelt, Md., and includes investigators from the University of New Hampshire, the Naval Research Laboratory (NRL), Wash., D.C., and the Max Planck Institute of Extraterrestrial Physics in Germany. The spacecraft was launched from Florida on Feb. 14, 1980, and is the first satellite to be repaired in space.

The SMM results were reported to the scientific community on December 11, in an International Astronomical Union telegram by Dr. Steve Matz, NRL and the SMM co-investigators. Both the SMM and balloon experiment results were reported in Washington on December 14, at a nuclear spectroscopy symposium.

NASA's Supernova Observation Campaign is funded by the Office of Space Science and Applications' Astrophysics Division,

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Washington, D.C., and involves Marshall Center, the NASA Ames Research Center, Mountain View, Calif., the NASA Jet Propulsion Laboratory, Pasadena, Calif., and the NASA Goddard Space Flight Center, Greenbelt, Md., and various institutions, universities and scientists throughout the nation and the world.

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NASA AWARDS CONTRACTS TO SPACE STATION CONTRACTORS

The Marshall Space Flight Center, Huntsville, Ala., today awarded a letter contract to the Boeing Aerospace Company of Huntsville, Ala., to perform detailed design, development, test, evaluation and delivery of components and systems for the nation's permanently manned Space Station. Three other letter contracts are being awarded by other NASA centers involved in the Space Station program.

Under Marshall's direction, Boeing will begin working toward the program's next major milestone, the Program Requirements Review (PRR) which will establish the Space Station configuration

(MORE)

to guide the contractors' preliminary designs. The PRR will be conducted next spring. The negotiated cost-plus-award-fee contracts will be signed in the next several months.

Award of the letter contracts follows Congressional action and the President's approval of the overall funding bill for the federal government under which a total of more than \$500 million will be available in Fiscal Year 1988 for Space Station development activities. This amount includes funds remaining available from the FY 1987 appropriation for Space Station development as well as the new funding provided under the FY 1988 bill just approved.

Under its contract with Marshall, Boeing will provide the U.S. laboratory and habitation modules, logistics elements, resource node structures, airlock systems, environmental control and life support system, internal thermal, audio and video system, and associated software. The other companies issued NASA letter contracts are: McDonnell Douglas Astronautics Co., with locations in Huntington Beach, Calif., and Houston; General Electric Company, Astro-Space Division, with locations in Valley Forge, Penn., and East Windsor, N.J.; and Rocketdyne Division, Rockwell International, Canoga Park, Calif.

The Space Station will be a permanently manned orbital base in Earth orbit for the conduct of scientific research and development of new technologies, and will accommodate private sector research and development activities. In the future, the Space Station will serve as the staging base for continued manned

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and unmanned exploration of the solar system. The Space Station will be placed in orbit in the mid-1990's and will be capable of growth both in size and capability. The Space Station will operate for several decades, well into the 21st century.

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WHITE SANDS TO BE ALTERNATE LANDING SITE FOR SHUTTLE FLIGHTS

NASA today announced that White Sands Space Harbor, N.M., (formerly known as Northrup Strip) has been designated as an alternate end-of-mission landing site for Space Shuttle missions STS-26 through STS-28.

The alternate site would be used for a Shuttle landing if conditions were present that precluded a nominal end-of-mission recovery on lakebed Runway 17 at Edwards Air Force Base, Calif., the primary landing site.

The landing site options will be reassessed after completion of the next three flights, when data on the improved Shuttle brakes and other technical issues have been analyzed.

The White Sands site was previously used on STS-3, the third orbital test flight, at its conclusion on March 30, 1982. That site was selected before launch because of continuing rain at Edwards which created a muddy lakebed unacceptable for landing.

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